APRIL 1960

# FOOD PROCESSING

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE See table of contents, page 5

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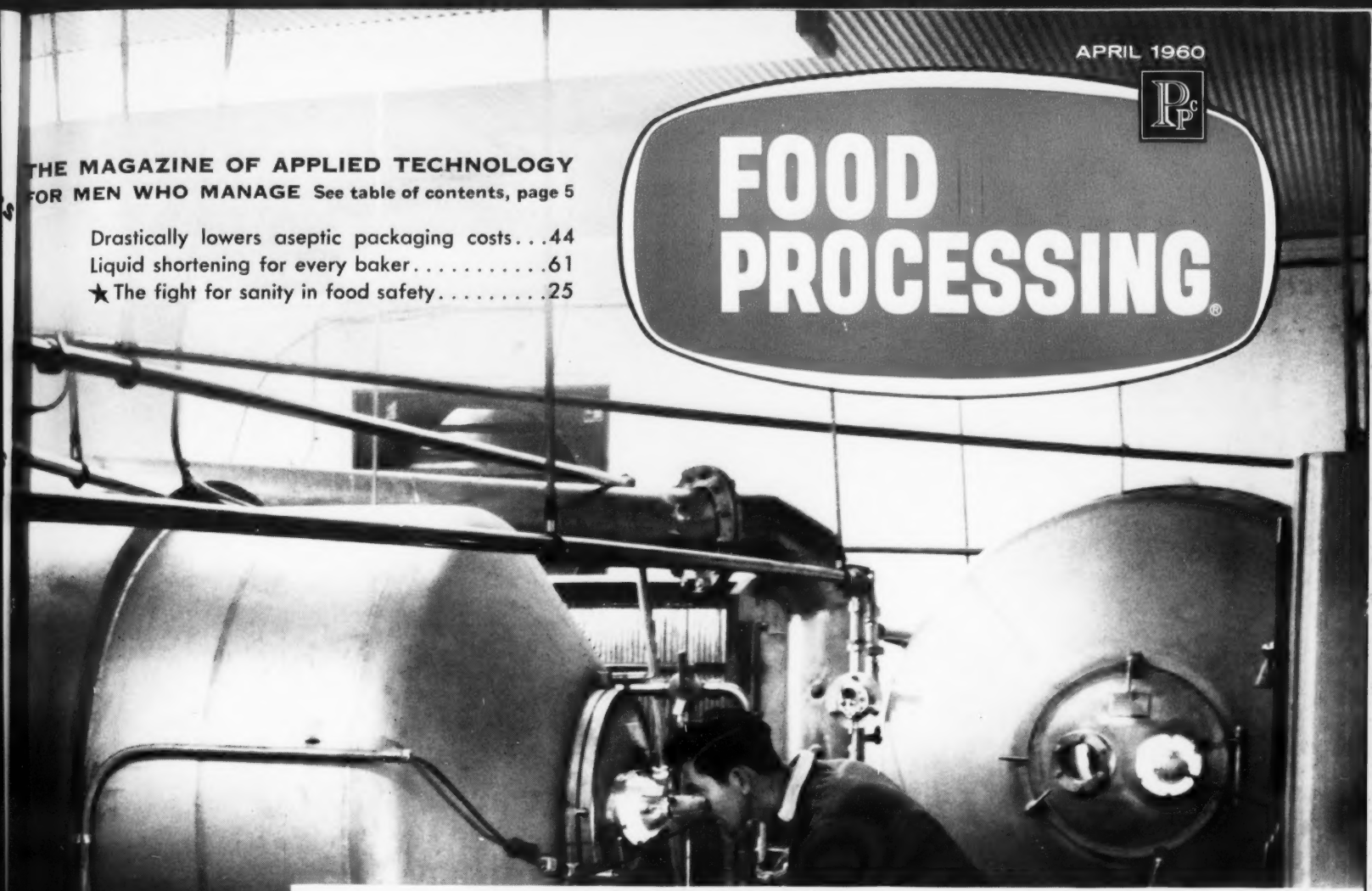

## for heat-sensitive products
## MAJOR ADVANCE IN EVAPORATION
### performance report on orange concentrate..34

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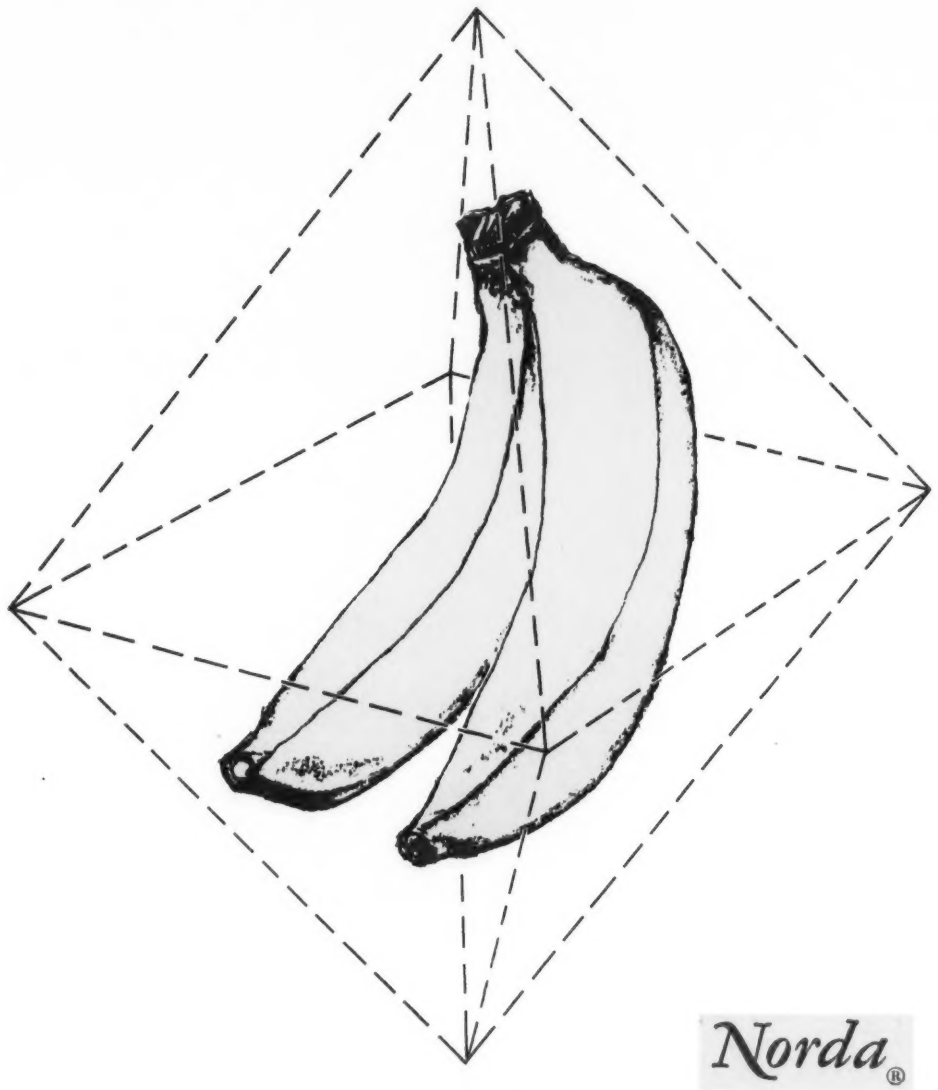

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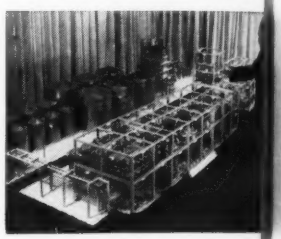
## that's interesting

### Moss on your steak, sir?

The name "mushroom" describing a fungus-type vegetable, comes, logically, from the Teutonic word "moss." The Latin for moss is "mucus" and in Old Slavic it became "muchu." Old French doctored it to "mouscheron" and in Middle English it became "muscheron." Get it?

### Model food oil plant models American way

A 1/32 scale model of an American vegetable oil processing plant will be exhibited at the World Agricultural Fair in New Delhi, India, late this year to show Asians how



modern food processing techniques can contribute to utilization of edible oils from cotton seed, peanuts and sunflower seeds. The model, designed and built by Chemetron Corp.'s Girdler Process Equipment Division, is of a $2,500,000 plant able to handle four railroad cars of crude oil a day.

### The good seed

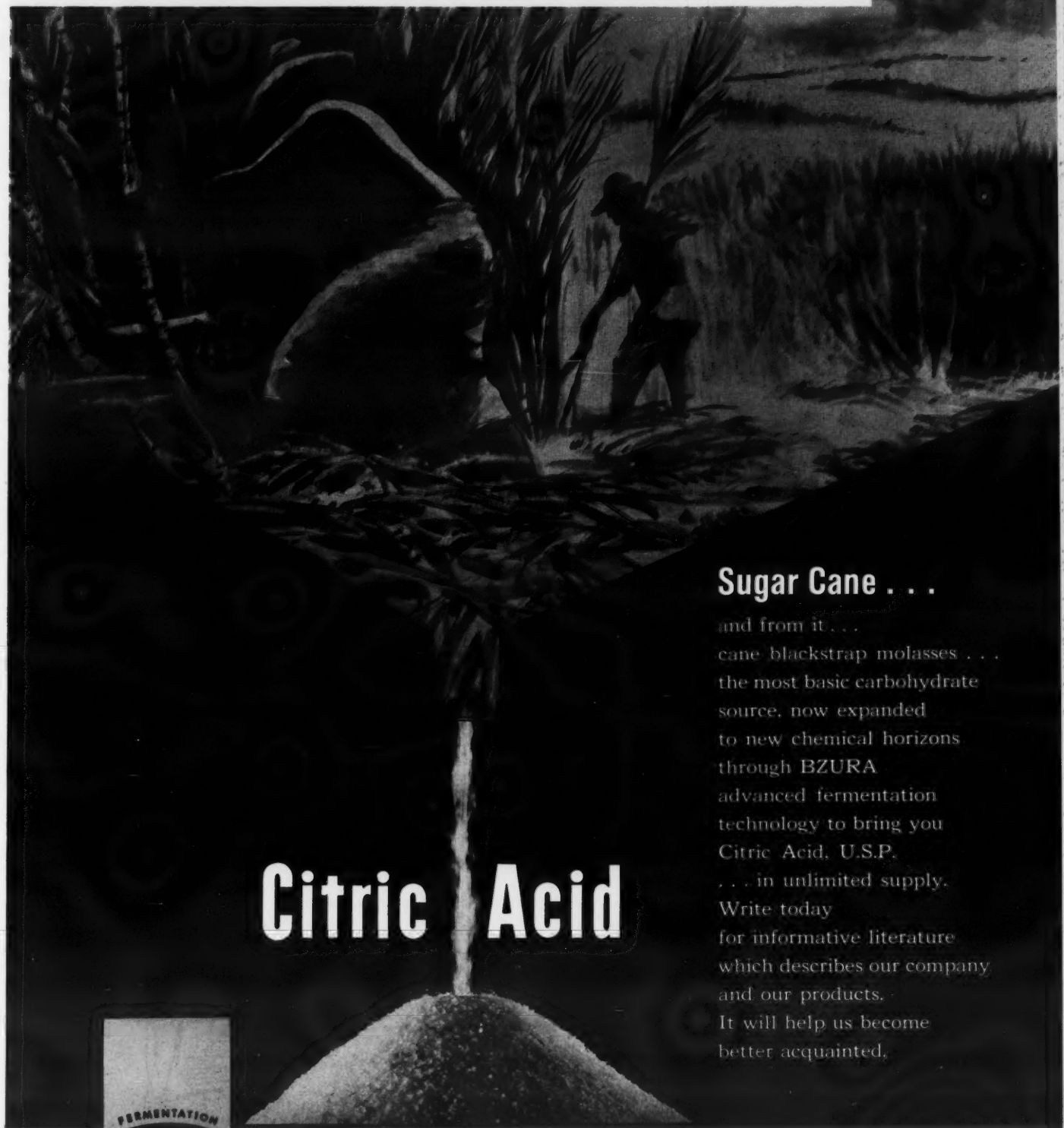
Contrary to popular opinion, seedless watermelons are grown from seed.

### 'Food of the gods'

Wild Mushrooms, which first gained recognition by the Roman Empire in the 1st century, B. C., were called "food of the gods." They were thought to provide warriors with unusual strength.

more inform... on prod... right, circle... see inform... request ... opposite last

# Source unlimited...



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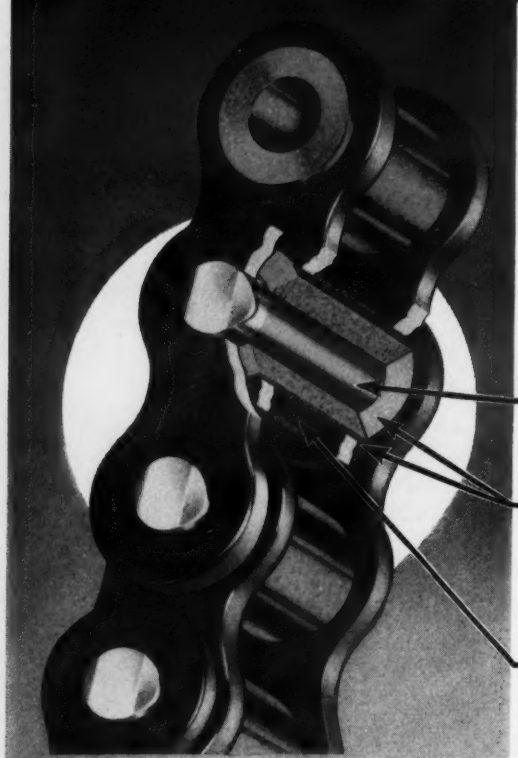
# BUILT-IN LUBRICATION AT ALL 3 CRITICAL AREAS



Whitney MSL Chain is lubricated for life by oil-impregnated, sintered steel bushings—an exclusive development of Whitney Research. With this development, Whitney solves a basic chain problem . . . **more damage is caused by faulty chain lubrication than by years of normal service.** Pressure and heat cause built-in lubricant to expand and flow from bushings, providing a constant supply of lubricant to every working part of the chain. When drive stops, bushings re-absorb oil, ensuring a permanent oil supply for the life of the chain. By solving the lubrication problem, and because of other important design advantages, Whitney MSL Chain outlasts conventional chain as much as 5 to 1 in severe operating environments.

**Critical Area 1**

**PIN**—Protective film of oil completely lubricates the live bearing area between pin and bushing, minimizing wear by reducing metal-to-metal contact.

**Critical Area 2**

**PLATES**—Whitney oil-impregnated sintered steel bushings extend beyond surface of inside plates to: act as lubricated thrust bearings, control clearance, and provide an oil cushion between plates, eliminating plate galling and seizing frequently caused by misalignment of sprockets.

**Critical Area 3**

**SPROCKET ENGAGEMENT**—Oil film on exterior surface of Whitney MSL Sintered Steel Bushings provides constant lubrication between sprocket teeth and chain. Whitney MSL Chain requires no rollers, as the tough oil film on the bushing surface provides smooth sprocket engagement, cushions impact and reduces drive wear.

Whitney oil-impregnated bushings—developed through continuous Whitney Research—are produced exclusively by Whitney to assure MSL Chain users of highest quality and reliability.

Inherent material characteristics of Whitney Sintered Steel Bushings, plus bushing configuration that provides greater contact area between bushings and links, permit high interference fit, which pre-loads links and gives maximum fatigue resistance.

Controlled clearance between plates promotes self-cleaning action.

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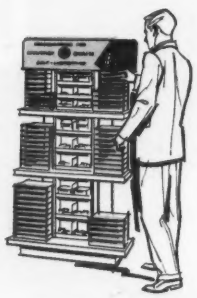
All essential dimensions of Whitney Standard and Extended Pitch MSL Chain conform fully to ASA Standards, making it completely interchangeable with any similar pitch ASA standard chain, simplifying specification for new equipment, or as a replacement for existing drives.

Whitney MSL Chain is carried in stock by Distributors in all parts of the United States, for prompt delivery.

* **Maximum Service Life**

MSL Chain is carried IN STOCK by your Whitney Distributor. Ask him to show you how and why Whitney MSL Chain gives you more chain drive value per dollar.



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over the editor's shoulder

## The industry's responsibility!

It should be self-evident that consumer confidence in processed foods is industry's prime responsibility.

But what has the food industry *as an industry* done to discharge this responsibility?

What is the industry as an industry doing on a long-range educational program to demonstrate to the public the need for and the benefit derived from the use of food additives as well as the chemicals required in the growing of crops?

Is not the ready acceptance by the uninformed public of alarmist writings appearing more and more frequently in the consumer press an indication of how little the industry as an industry has done in this direction?

"It would appear that industry has not fully utilized modern communications research. We do not turn communications on or off at will. To the extent that we fail to supply the true facts about foods, the communications media will secure less reliable information and distribute it. This is occurring too often."

The foregoing quote is from George Larrick's recent talk at the FLI-FDA 1959 conference. For what George Larrick's FDA has done in this direction we refer the reader to the review of FDA's new Leaflet on page 28.

/s/ Howard P. Milleville, Editor

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

FOOD PROCESSING

APRIL 1960
VOL. 21 NO. 4

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FOOD PROCESSING

(Food Processing Preview)

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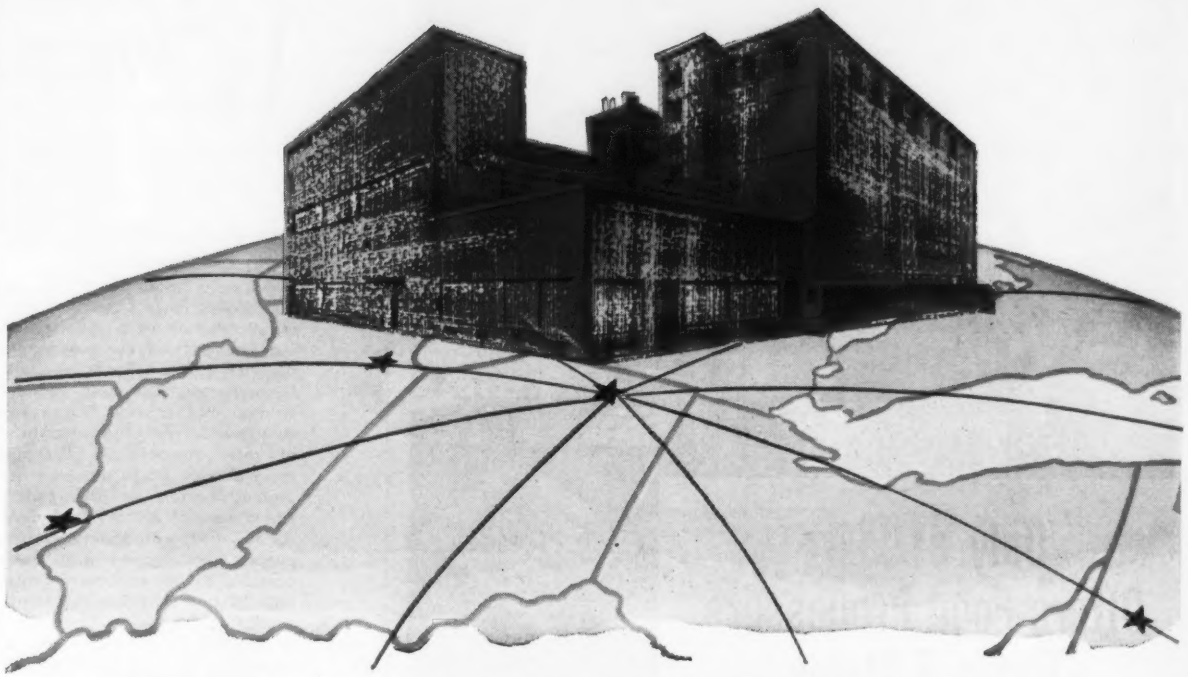

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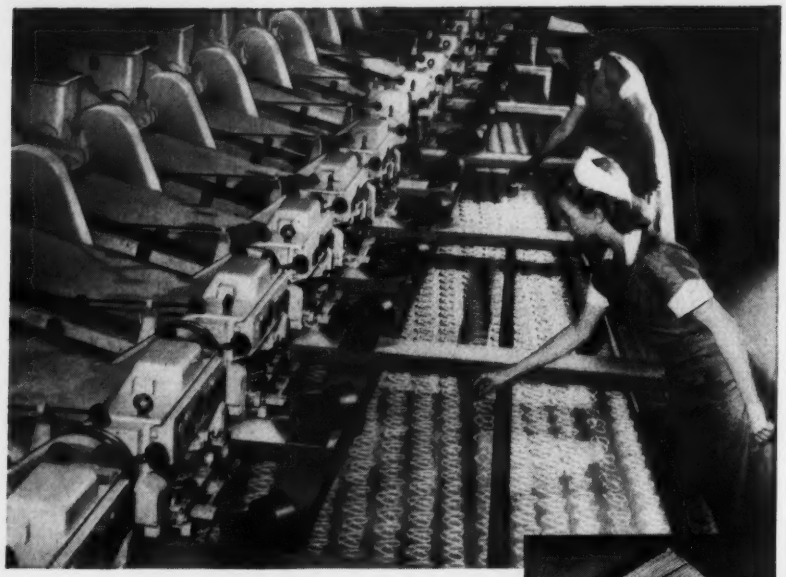

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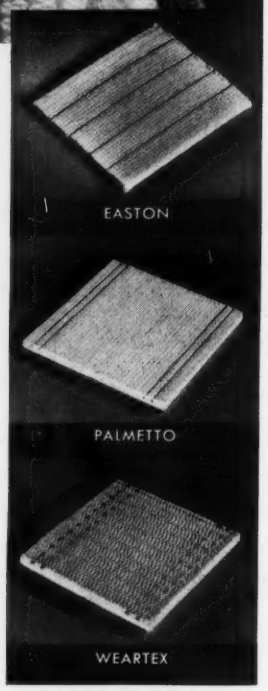


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# PRODUCTS AND PACKAGES

### *First main-dish meal from off-the-shelf . . .*

. . . Italian Style Casserole Mix is initial offering in a still developing General Foods convenience line of "New Horizon Foods" — highly nutritious, low cost complete entrees that provide frozen food convenience, yet store indefinitely at room temperature. Complete main dish of elbow macaroni and protein morsels (a raw, concentrated natural protein food developed by GF), with onion and green pepper, and topped with cheese contains 31 per cent more protein and 56 per cent less fat than a similar dish made with one-half lb of chopped meat. When water and tomato paste or sauce are added to contents, the 8½-oz package serves four generously, at cost of 25 cents or less per serving (including the tomato paste or sauce).

Product may be mixed in two min, then baked and served in the self-contained aluminum foil dish. Following test-market success in Burlington, Vt., product distribution is being expanded to Boston, Louisville and Denver areas.

### *No mashed potatoes . . .*

. . . enroute to market, or in storage, when packed in two-piece carton, and overpacked 16 cartons to a corrugated shipper. Printed top section has cello windows and removable perforated tear flaps (not shown) which protect potatoes until ready for display. Corrugated bottom stapled to top keeps products from moving about. Cartons also work with grapes, apples, plums, pears, peaches, other produce.
(Sunny Pak cartons are manufactured by Marathon, A Division of American Can Co., Menasha, Wis.)
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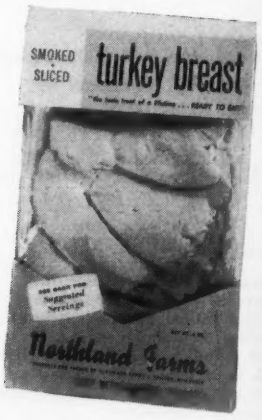


### *Transparent 'carton' . . .*

. . . for smoked, sliced turkey breast combines visibility of a vacuum-packed transparent bag with stackability of a folding carton. Paperboard tabs at top and bottom of package make it square as a carton.
(Designed by Hudson-Wolter & Associates, Inc. of Neenah, Wis., combination package was manufactured by John Strange Carton Co., Menasha, Wis.)
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***Canned foods from the cloister . . .***

. . . now making bid for national distribution, consist of connoisseur-quality vegetables in regular #303-size cans, or in institutional-size #10 cans. Vegetables are grown and harvested by the White-Robed Cistercians at Our Lady of Spring Bank Monastery, Okauchee, Wis., and canned under their supervision. The austere religious order refuses to accept any ecclesiastical revenue, instead lives by production and exchange of goods.

***Prominent ears . . .***

. . . of frozen corn, in polyethylene bag, are "whole product" sequel to line of "free-flow" frozen vegetables introduced in 1959 by Patterson Frozen Foods, Patterson, Calif., and packed in Crown poly® packs.
(Package for two ears of whole corn was designed and produced by Western-Waxide Division, Crown Zellerbach Corp., 2101 Williams St., San Leandro, Calif.) 6884 on Reader Service Slip.

***Body 'beads' save cans from jars . . .***

. . . resulting from normal rough handling in shipping and warehousing. Fully beaded body on the 303 by 406 open-top can increases panel resistance, minimizes denting and out-of-round containers. Tests reveal no likelihood of label-application problems. New can is offered at same price as unbeaded can of same size.
(New beaded can in the 303 family size, for selected fruit and vegetable products, is development of Continental Can Co., 100 E. 42nd St., New York 17, N.Y.) 6885 on Reader Service Slip.

***'Bake-In' squash . . .***

. . . latest variation on the "boil-in-bag" theme, is being marketed in Boston area by Suffolk Farms Packing Co., Inc., of Chelsea, Mass. Portion of cut Hubbard squash is baked right in the package. Unique package, consisting of foil-lined paper tray and a heat-sealed overwrap of Du Pont Mylar, also has potential for such foods as baking apples, sweet potatoes.


# DAY

Pneumatic Conveying & Bulk Storage News

**FREE! 2 valuable guides for selecting PNEUMATIC CONVEYING and BULK STORAGE TANKS**

**BULLETIN M-588—12** page DAY pneumatic conveying guide just off the press. Discusses types of systems, illustrates and diagrams high and low density arrangements, shows equipment and tells "why" and "wherefore" of all types of pneumatic conveying including so-called fluidizing systems.

**BULLETIN 574—12** pages, describes horizontal and vertical storage tanks. Points out savings and is filled with photos of various installations plus description of auxiliary equipment.

Whatever your pneumatic conveying or bulk storage problem, look first in these DAY bulletins. They are valuable aids in selecting and ordering the right equipment for your plant. For your free copies use reader service card of this magazine or write direct toDAY.

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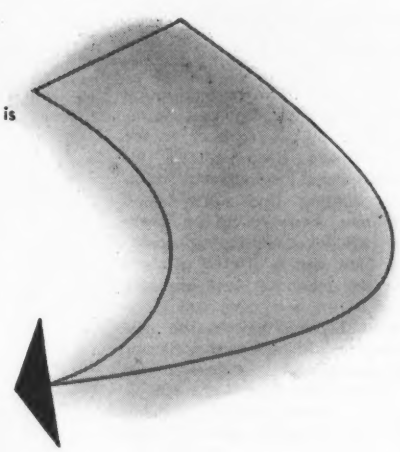
# for fast, even feeding of freezer belts

**Simplicity 18" x 11'-0" KA Stainless Steel Feeder Feeds 8,000 lbs. of Corn or Peas Per Hour—Entire Width of Freezing Belt**

A problem familiar to all frozen food manufacturers is even distribution of product over the entire width of the freezing belt. This problem is solved with a SIMPLICITY Stainless Steel Feeder.

The feed end of the feeder is equipped with a 3 foot section of Bixby-Zimmer decking which dewaters the product. The remaining 8 feet of deck surface is slotted diagonally, allowing the peas or corn to be deposited at the correct depth and distributed across the full width of the freezing belt. The product flow is regulated by a gate, positioned along the diagonal slot, which is adjustable from a closed position to a 2 inch opening.

**SIMPLICITY engineers are ready to help you on any food handling problem. Write Department 7 or call SIMPLICITY ENGINEERING COMPANY, DURAND, MICHIGAN. Phone 46.**



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## association news

**Borden Awards** of $1,000 each have been given by the **Borden Milk Co. Foundation** to the following food technologists through the professional organizations indicated: American Chemical Society, to **Dr. Charles A. Zittle,** for studies in milk; American Dairy Science Assn., to **Dr. Marvin L. Speck,** for studies of nutrition of bacteria, and to **Dr. N. L. VanDemark,** for cattle reproduction studies; American Home Economics Assn., to **Dr. Mary Brown Patton,** for nutrition studies; American Institute of Nutrition, to **Dr. Harry Steenbock,** for studies in mineral metabolism and the physiological chemistry of vitamins A and D; American Academy of Pediatrics, to **Dr. Harold C. Stuart,** for studies in childrens' growth patterns; Poultry Science Assn., to **Dr. A. V. Nalbandov,** for studies of the endocrinology of the growth and reproduction of fowl.

**American Assn. of Cereal Chemists,** St. Paul, Minn., will hold its 45th annual meeting May 1-5 at the Morrison Hotel, Chicago. Sessions will cover cereal processing, flavor research, prepared mixes, baking and baking technology, process control in the fermentation industry, feeds and feed supplements, cellular concepts in cereal research, cereal protein research and methods and gadgets useful in control.

**General Foods Corp.** is continuing in 1960 its unique, four-yr-old High School Teacher Fellowship Program which has totaled $34,500 in cash grants to date. The program, active in 16 communities throughout the nation, is devoted to assisting high school teachers in summer work which will raise their professional skills, and thus benefit their localities. Local school authorities choose the teachers, in subjects they wish to emphasize. The company does not participate in administration of the grants.

## food regulations

# Congress Asks Scientists to Report on Delaney Clause

**Chairman Harris of House Interstate and Foreign Commerce Committee wants their views on carcinogens**

A panel of scientists has been called together by Chairman Oren Harris (D., Ark.) of the House Interstate and Foreign Commerce Committee to present their views on carcinogens in the food supply.

The panel, assembled by the National Academy of Sciences, will appear on the 5th and 6th of this month at public hearings.

Mr. Harris made the specific announcement on March 11 when he reconvened his committee to hear representatives of USDA at his invitation give their views on color bills and the Delaney Amendment.

At earlier sessions on color legislation Mr. Harris indicated that no legislation would get through the Congress without a cancer clause of some kind. He added, however, that further study is necessary before the committee can decide on whether to recommend a modification of the Delaney clause in the Food Additives Law and in pending color legislation.

At that time he said informally that he would call together a panel of scientists to advise the committee.

At the March 11 hearings USDA sent, as its principal representative, Dr. M. R. Clarkson, Associate Administrator of the Agricultural Research Service.

To the consternation of several of the committee members, Dr. Clarkson ducked any discussion of USDA's views on the Delaney Amendment. He urged "careful consideration. . . . of the so-called anti-cancer clause."

Referring to the upcoming panel discussion and the food additives report now under study by the White House, Dr. Clarkson said his department would prefer to delay making any recommendation on the Delaney Amendment "until there has been opportunity to consider the matter further in the light of the facts developed by these studies."

He added when questioned that scientific and professional judgment must be used in interpreting the Delaney Amendment.

Congressman J. Arthur Younger (R., Calif.) said that it wasn't easy to attempt to legislate in a "complete condition of hysteria" due to widespread publicity on cranberry and other incidents.

### Evaluating safety of food additives

"Principles and Procedures for Evaluating the Safety of Food Additives" is the revised statement of The Food Protection Committee, National Research Council, December, 1959.

Copies of the 20-page booklet are available without charge. Address your request to National Academy of Sciences, National Research Council, Washington 25, D.C. Ask for Publication 750.

In the appendix of this publication is a statement on insignificant levels of chemical additives in foods, which is reprinted in full on page 26 of this issue.

### FDA sets zero tolerance on heptachlor

FDA has set a zero tolerance for residues of heptachlor and heptachlor epoxide. The action bans any amount of residue of heptachlor in or on foods shipped in interstate commerce.

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FDA says

## Additive Situation Becoming Clearer

Now that the Food Additives Amendment has been in effect for one month, how does the situation look to FDA and the Department of HEW?

Here's what one FDA official told FOOD PROCESSING —

"The picture of the food additive situation as a whole is becoming clearer week by week and we are optimistic about the outlook." He went on to say that as the industries carry out their responsibility under the law, this is going to "cut down the number of situations where there is doubt and apprehension."

The "tremendous backlog of work" is being successfully attacked and once this backlog is out of the way the whole matter should become quite routine. The FDA spokesman admitted that the job is bigger than anybody thought it would be but that the agency is making good progress.

FDA has found that the number of food additives is much greater than previous estimates. But they won't reveal at present just what the sum total is.

FDA officials believe it is "inevitable" that there will be a few materials that will not get time extensions and will be the targets of regulatory action. But there has never been any black list of crackdown items.

Discussing extension of the law's effective date, the FDA official spoke of a "great many materials running into the hundreds" that will have time extensions.

This is because data is lacking to confirm their safety, but FDA doesn't know any good reason for questioning that safety. Thus more time is provided for the firms to study these materials and determine whether they are generally recognized as safe or require further scientific evaluation. According to FDA, the likelihood is that the ma-

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jority of them at least will eventually be classified as generally recognized as safe.

These time extensions, FDA says, show the extent to which industry has not developed very complete evidence of safety and the backlog of food chemicals whose safety hadn't been fully established.

On the other hand, prior sanctions show the extent to which industry has been carrying out the principles of the law in the years before it was enacted.

"What the law has made possible," the spokesman said, "is to go over the entire food supply of the country with a fine tooth comb and determine what materials and ingredients need further scrutiny and this is a cooperative endeavor."

### FDA acts on 230 more packaging chemicals under Additives Law

67 substances, which may become components of food as a result of their use in paper and paperboard packages, are proposed as "generally recognized as safe."

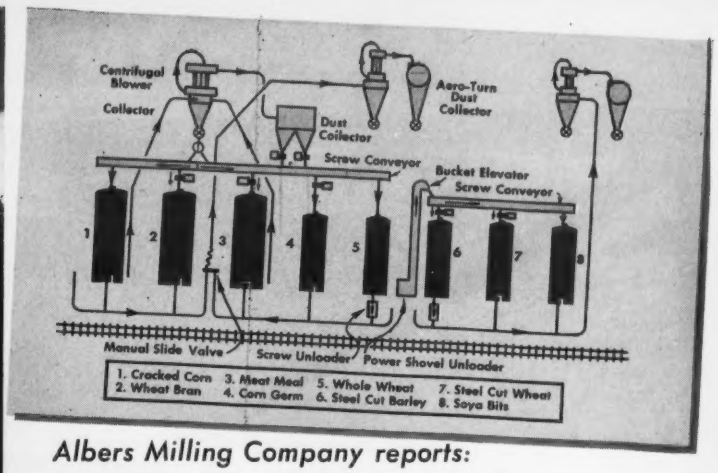
If qualified experts agree that these substances are generally recognized as safe, no further safety testing will be required.

Time extensions, up to an additional year, have been granted manufacturers and users of 135 other packaging materials. FDA said the extensions were based on an item-by-item determination that continued use of these materials for one year presents no undue hazard to health.

These lists, FDA pointed out, include only those paper packaging substances that have been presented to the agency for clearance. The omission of any chemical or substance from a list, it was emphasized, does not necessarily mean its use in food packaging is banned.

The substance, seemingly omitted, may be one that does not get into food, or one which is generally recognized as safe and for which the

**JEFFERSON, WIS.** — Five 14′ x 40′ and three 20′ x 50′ *Permaglas* Mechanized Storage Units.




*Albers Milling Company reports:*

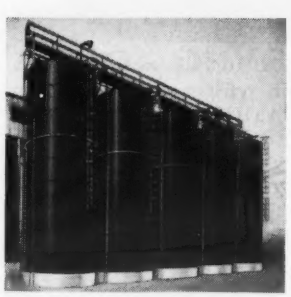
## "Permaglas® Mechanized Storage System cut our feedstuff handling cost over 50%...bulk savings average $4.00 per ton"

As illustrated in schematic diagram, the Albers Milling Company's plant, Jefferson, Wis., uses two separate unloading and transfer systems which consist of eight *Permaglas* Mechanized Bulk Storage Units (five 14′ x 40′ and three 20′ x 50′). They are equipped with A. O. Smith's exclusive mechanical sweep-arm bottom unloaders. The automatic *Permaglas* system makes possible completely sanitary storage and conveying of whole and cracked wheat, and soft ingredients for production of dry and canned dog food—called Friskies. Ten additional *Permaglas* Units with mechanical unloaders are serving at two other Albers Milling plants in Los Angeles and Kansas City.

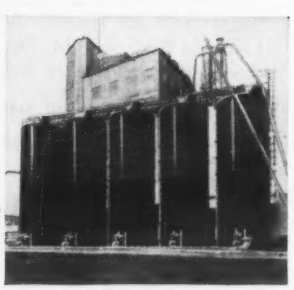
Albers' Jefferson plant reports these substantial cost-savings in time, labor and bulk purchases: **more than 50% savings in labor handling costs . . . $4.00 per ton savings from bulk purchases rather than in sacks . . . considerable gain in warehousing storage space.**

The *Permaglas* Structures are glass-fused-to-steel construction both inside and out. They provide utmost sanitary, easy-to-clean systems. The gleaming coat of glass is permanently bonded to steel at temperatures in excess of 1500° F. with bonded strength up to 20,000 psi. What's more, the rugged, mechanical sweep-arm bottom unloader discharges free-flowing materials rapidly and efficiently—eliminating packing and bridging.

Like Albers Milling, you, too, can boost profits with a *Permaglas* Mechanized Bulk Storage and Unloading system. For more details on *Permaglas* Storage Systems, mail coupon today.



**LOS ANGELES, CALIF.** Five 14′ x 40′ *Permaglas* Mechanized Bulk Storage Structures.



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question of safety has not been raised.

No further testing will be required on 28 paper packaging materials which have prior sanctions. These were authorized as safe by FDA before the Food Additives Amendment was enacted.

The materials involved in FDA's action are in addition to the list of 84 packaging chemicals published in February as having prior sanctions.

Special lists of adhesive materials, can enamels and miscellaneous substances are in the works.

Current lists follow.

### FDA proposes 67 packaging materials be recognized safe

FDA proposes that the following list of substances, which may become components of food as result of their use in paper and paperboard packages, be listed as "generally recognized as safe."

Acetic acid
Alum (double sulfate of aluminum and ammonium potassium, or sodium)
Aluminum hydroxide
Aluminum oleate
Aluminum palmitate
Ammonium chloride
Ammonium hydroxide
Calcium chloride
Calcium hydroxide (lime)
Calcium sulfate
Casein
Cellulose acetate
Clay (kaolin)
Copper sulfate
Cornstarch
Corn sugar (syrup)
Dextrin
Diatomaceous earth filler
Ethyl cellulose
Ethyl vanillin
Ferric sulfate
Ferrous sulfate
Formic acid or sodium salt
Glycerin
Guar gum
Invert sugar
Iron, reduced
Locuse bean gum (carob bean gum)
Magnesium carbonate
Magnesium chloride
Magnesium hydroxide
Magnesium sulfate
Methyl and ethyl acrylate
Mono and diglycerides from glycerolysis of edible fats or oils

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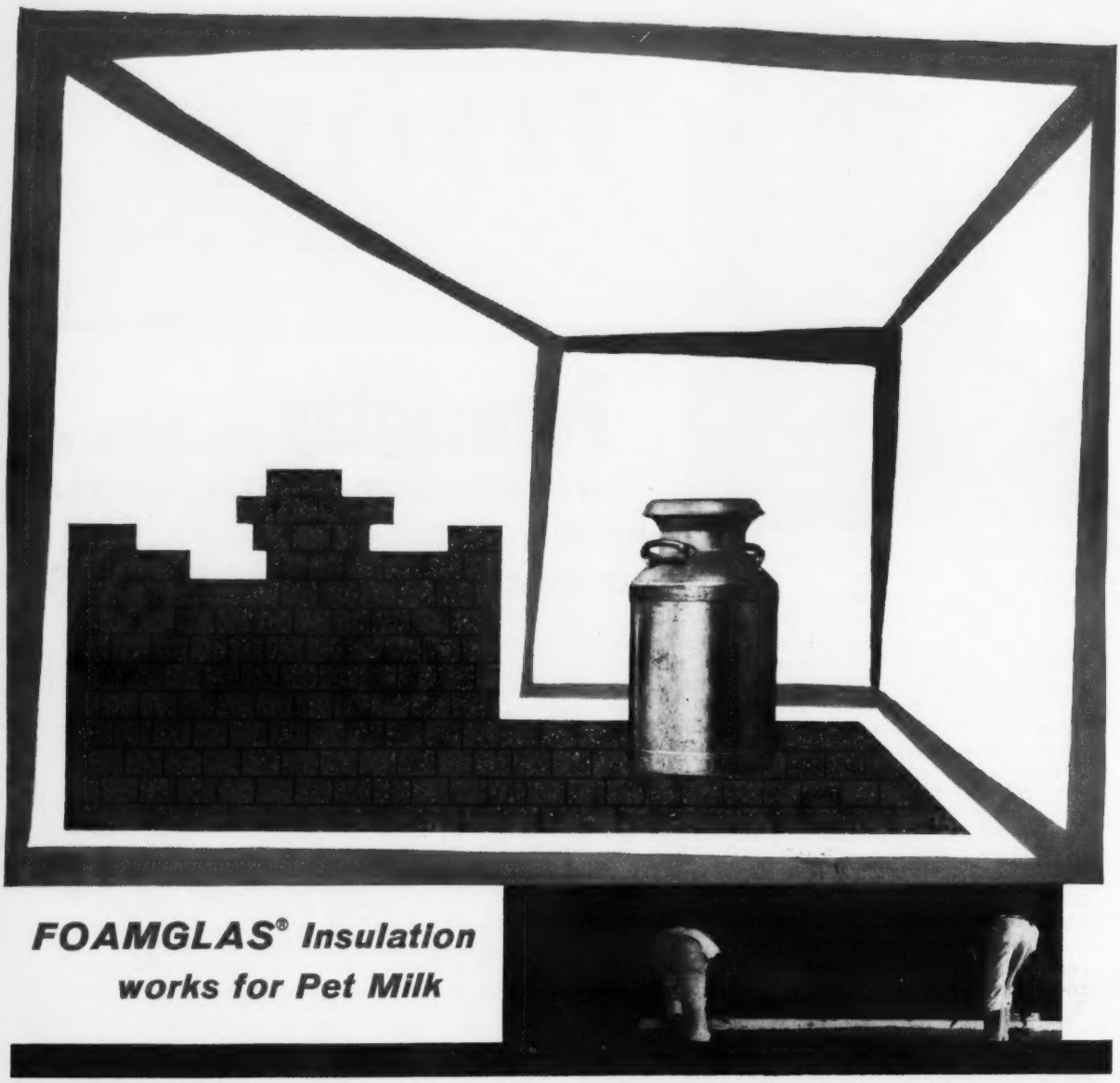


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# "Knox furnishes us the packages that sell," say executives of major olive and pickle packer

"When packed in glass, stuffed olives—with their eye-catching colors—are a real stop signal to grocery store shoppers," says the manager of the olive department of one of America's leading food packers,* a major user of Knox glass.

"In our olive department, for example, 85% of the glass jars we use—in nine different sizes—are Knox products.

"We take full advantage of Knox's quality and clarity by hand-packing our olives in patterns that give maximum package attractiveness. We've found that this, plus proper display in the store, can increase a grocer's olive sales by ten to fifteen percent."

*Name available on request.

The manager of the same company's pickle department says: "In modern supermarkets, the product has to sell itself. That's why we use glass—to take advantage of impulse buying. Knox's quality glass can take the strain of the packing process—including the thermal shock of pasteurizing—and still give us the best available sales package."

Find out how Knox's quality product, reliable delivery, and outstanding service can play an important role in increasing your sales by furnishing the package with maximum shelf-impact. Contact Knox Glass, Inc., Knox, Pa., or any one of Knox's 37 sales offices.

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Oleic acid
Oxides of iron
Potassium sorbate
Propionic acid
Propylene glycol
α-Protein
Silicon dioxides
Pulps from wood, straw, bagasse, or other natural sources
Soap (sodium oleate, sodium palmitate)
Sodium aluminate
Sodium carbonate
Sodium chloride
Sodium hexametaphosphate
Sodium hydrosulfite
Sodium hydroxide
Sodium phosphoaluminate
Sodium silicate
Sodium sorbate
Sodium sulfate
Sodium thiosulfate (0.1% in salt)
Sodium tripolyphosphate
Sorbitol
Sulfamic acid
Sulfuric acid
Starch, acid modified
Starch, pregelatinized
Starch, unmodified
Sucrose
Talc
Urea
Vanillin
Zinc hydrosulfite
Zinc sulfate

## Time extensions granted for 135 packaging materials

FDA has granted time extensions up to an additional year from March 6, 1960 for the following 135 substances migrating from paper and paperboard products used in food packaging.

### DEFOAMING AGENTS

Aliphatic hydrocarbon fractions of petroleum
Castor oil
Cetyl alcohol
Coconut alkylolamide
Coconut oil, sulfonated
Cottonseed fatty acid
Cyclohexanol
Diethamolamine stearate
Ethylenediamine tetraacetic acid tetrasodium salt
Formaldehyde
Glyceryl monohydroxystearate
Hexadecanol
Hexylene glycol
Hydrogenated fish oil
Isobutano
Isopropanol
Kerosene, completely aliphatic
Kerosene oil
Kerosene oil, deodorized
Lauryl alcohol
Lignin sulfonate sodium salt
Marine oil fatty acid soaps (hydrogenated)
Methyl oleate
Methyl oleate-palmitate mixture
Methyl tallowate
Mineral oil
Mustardseed oil, sulfated
Myristyl alcohol
Naphtha
Oleic acid, animal source
Oleic acid, sulfated
Oleic acid, vegetable source
Oil paraffin
Oil paraffin, pale paraffin oil
Parachlorometacresol
Paraffin wax
Peanut oil, sulfated
Pentaerythritol monostearate
Polyalkylene glycol ether
Polyethylene (slightly oxidized)
Polyethylene glycol, ester of rosin (15 M)
Polyethylene glycol, ester of rosin octylphenol
Polyethylene glycol 200, monotallate
Polyethylene glycol 200, monooleate
Polyethylene glycol 200, monostearate
Polyethylene glycol 400, ditallate
Polyethylene glycol 400, dioleate
Polyethylene glycol 400, distearate
Polyethylene glycol 400, monococoate
Polyethylene glycol 400, monolaurate
Polyethylene glycol 400, monooleate
Polyethylene glycol 400, monostearate
Polyethylene glycol 400, monotallate
Polyethylene glycol 400, tallow diester and glycerides
Polyethylene glycol 450, monostearate
Polyethylene glycol 600
Polyethylene glycol 600, monooleate
Polyethylene glycol 600, monoricinoleate
Polyglycol ether of tridecyl alcohol
Polyoxyethylene sorbitan monostearate
Rice bran oil
Rice bran oil, sulfated
Ricinoleate (butyl)
Ricinoleate (methyl)
Sodium stearate, technical grade
Sorbitan monostearate
Sorbitan tristearate
Sperm oil, sulfated (75%)
Stearic acid
Stearic acid, single pressed
Stearic acid, double pressed
Stearic acid, rubber grade
Stearic palmitic acids, 63:29
Stearyl alcohol, technical grade, approximately 65%-80% stearyl and 20%-35% cetyl
Tall oil fatty acid, methyl ester
Tall oil, refined
Tallow, alcohol, hydrogenated
Tallow, blown (oxidized)
Tallow
Tallow fatty acids
Tallow fatty acids, hydrogenated
Tallow, hydrogenated
Tallow, monoglyceride
Tallow, propylene glycol ester
Tallow, sodium soap
Tallow, sulfated (75%)
Tallow, sulfated (80%)
Tallow, sulfonated (50%)
Tallow, unbleached
Triethanolamine (98%)
Triisopropanolamine
Zinc stearate

### ROSIN AND ROSIN DERIVATIVES

As incidental additives to food from the use as components of adhesives, wax and other coatings, plasticizers, inks, lacquers, sizings, paper finishers, defoaming and dispersing agents, intended for use in the manufacture of paper and paperboard for the packaging of food.

Wood rosin, gum rosin, and tall oil rosin and the dimers thereof, and these substances as modified by the following reactants:

Bisphenol-formaldehyde
Ethylene glycol
Formaldehyde
Fumaric acid
Glycerin
Hydrogen
Maleic anhydride
Methanol
Pentaerythritol (double-crystallized)
Phthalic anhydride
Sulfuric acid
Triethylene glycol

### MISCELLANEOUS CHEMICALS AND SUBSTANCES USED IN THE MANUFACTURE OF PAPER AND PAPERBOARD FOR FOOD PACKAGING

As incidental additives to food from the use as components of adhesives, wax, and other coatings, plasticizers, inks, lacquers, sizings, paper finishes, slime-control agents, dispersing agents, and/or other uses:

Acrylic and methacrylic esters (aqueous emulsions of polymers)
Animal glue
Anionic polyacrylamide
bis (1,4-Bromoacetoxy)-2-butene
Carbon black prepared by the "impingement" or "channel" process
Dibutyl phthalate
Dicyclohexylphthalate
Dicyandiamide
Dimethyl polysiloxane polymer
Dioctyl sodium sulfosuccinate
Hydroxyethylcellulose
β-Hydroxyethyl pyridinium salt of 2-mercaptobenzothiazole
Hydroxyethyl starch
Mixture of the ketene dimers of palmitic and stearic acids
Monosulfonated naphthalene
Oxidized starch
Pentaerythritol ester of maleic anhydride
Polyamide-epichlorohydrin resin
Polyoxyethylated castor oil
Polyoxyethylated oleyl alcohol
Polyvinyl alcohol
Sodium dodecylbenzene sulfonate
Sodium lauryl sulfate
Sodium ligninsulfonate (sodium lignosulfonate)
Sodium nitrate
Sodium salt of naphthalene sulfonic acid condensed with formaldehyde
Sodium salts of dimethyl dithiocarbamic acid and 2-mercaptobenzothiazole
Triethylene glycol polyester of phthalic anhydride (modified)
Vinyl acetate dibutyl maleate copolymer
Zinc dimethyldithiocarbamate in combination with zinc salt of 2-mercaptobenzothiazole

## Prior sanctions make 28 packaging materials safe

Prior sanctions from FDA eliminate the need for further testing of the following 28 substances used in paper and paperboard products for packaging foods.

An * following the name of the material indicates that under the conditions of normal use, these substances would not reasonably be expected to migrate to food, based on available scientific information and data.

Aliphatic polyoxyethylene ethers*
1-Alkyl ($C_8$-$C_{18}$) -amino-3-aminopropane monoacetate*
Borax or boric acid for use in adhesives, sizes, and coatings*
Butadiene-styrene copolymer
Chromium complex of perfluoro-octane sulfonyl glycine for use on paper and paperboard which is waxed*
Disodium cyanodithioimidocarbamate with ethylene diamine and potassium N-methyl dithiocarbamate and/or sodium 2-mercaptobenzothiazole (slimicides)*
Ethyl acrylate and methyl methacrylate copolymers of itaconic acid or methacrylic acid for use only on paper and paperboard which is waxed*
Hexamethylene tetramine as a setting agent for protein, including casein*
1-(2-Hydroxyethyl)-1-(4-chlorobutyl)-2-alkyl ($C_8$-$C_{17}$) imidazolinium chloride*
Itaconic acid (polymerized)
Melamine formaldehyde polymer
Methyl acrylate (polymerized)
Methyl ethers or mono-, di-, and tripropylene glycol*
Myristo chromic chloride complex
Nitrocellulose
Polyethylene glycol 400

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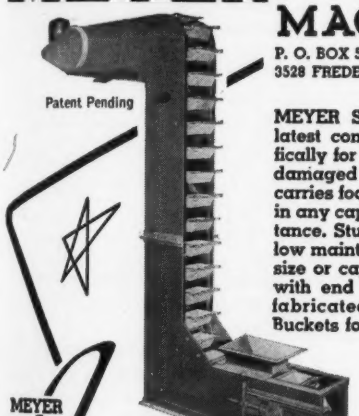

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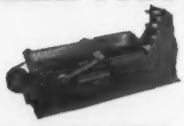

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VIBRA-FLEX FEEDERS and HOPPERS . .
TO ASSURE A UNIFORM FLOW OF MATERIAL

The built-in Adjustable VIBRA-FLEX Feeder, above, is used when SIMPLEX is fed from a holding bin. The Portable VIBRA-FLEX Feeder and Hopper, left, is used when manual feeding is desired. Feeding rate on both are adjustable.

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## food regulations

Polyvinyl acetate
Potassium pentachlorophenate as a slime control agent*
Potassium trichlorophenate as a slime control agent*
Pyrethrins in combination with piperonyl butoxide in outside plies of multiwall bags*
Resins from high and low viscosity polyvinyl alcohol for fatty foods only
Rubber hydrochloride
Sodium pentachlorophenate as a slime control agent*
Sodium trichlorophenate as a slime control agent*

### FDA STANDARDS

**Enriched Parboiled Rice:** At industry's request, the identity standard has been changed to allow butylated hydroxytoluene, a chemical preservative, to be used as an optional ingredient. The amount used may not exceed 3/1000ths of 1% by weight of the rice.

Label declaration must read: "Butylated hydroxytoluene added as a preservative."

Parboiled rice is whole rice that is steamed and vacuum-dried before it is milled. Process is intended to concentrate natural vitamins in kernels before hulls are removed.

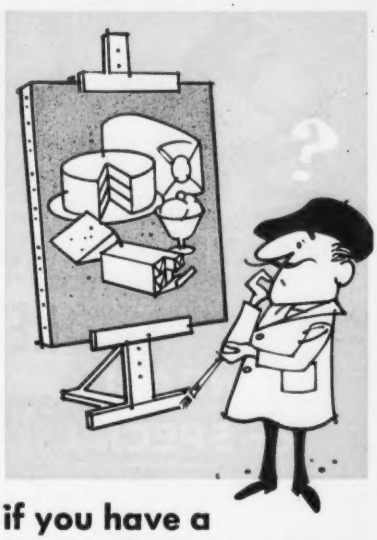
An undesirable flavor has occasionally developed in this product through release of oils that may become rancid on exposure to air. Use of the chemical preservative has been found in industry tests to retard rancidity and maintain flavor of parboiled rice.

Butylated hydroxytoluene has been used several years in foods such as breakfast cereals and shortenings.

Unless the FDA order is stayed in whole or in part by the filing of written objections, it will become effective this month.

**Orange Juice and Orange Juice Products:** After more than three years deliberation, FDA has announced new standards for commercially packed orange juice products, including undiluted and concentrated juice.

The standards require that labels bear information that will identify and describe the kind of product being offered. For example, regular orange juice which has been heated to destroy enzymes and microorganisms to make it keep longer must be labeled "pasteurized orange juice."

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## . . . use MARSCHALL ANNATTO COLORS

## . . . natural vegetable colorings!

From the heart of the Caribbean tropics come the amazing seeds that Marschall specialists transform into Annatto food colors of the utmost dependability.

From bright red to the palest yellow — for both water- and oil-base food products — Marschall has the formulation your product needs for top eye-appeal. A wide variety of Annatto Colors is in stock and immediately available. Marschall will also custom-blend to your exact specifications.

See how easily Marschall Annatto can solve *your* food coloring problem! Write for generous samples and price information. Your inquiry will be handled promptly. No obligation, of course.

Handy 1-oz. plastic dispenser sent FREE with initial order.

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## *food regulations*

Any orange juice product made entirely or partially from concentrate must bear a statement of that fact, such as "orange juice from concentrate" or "prepared in part from concentrated orange juice."

If the product is prepared in part from water extract of orange pulp, the label of a concentrate must carry a statement such as "prepared in part from water extract of orange pulp."

Products sold as concentrates to which the consumer adds water, and juices already prepared from concentrates, are both required by the standards to have a specified proportion of sugar to acid. The amount of water is restricted.

The standards allow natural sugars or orange juice concentrates to be added as optional ingredients to "sweetened" orange juice. However, a sweetener may not be used in such a way as to replace any part of the orange juice solids required to be in an unsweetened product.

Also permitted by the standards is the addition of regular juice to flavor a product sold as a concentrate.

The standards do not permit the use of artificial sweeteners or chemical preservatives. A petition for the establishment of a standard of identity for industrial orange juice with added chemical preservatives and other ingredients was denied.

According to FDA spokesmen, it has been almost impossible to reconcile industry differences on the content of the standards. With objections already coming in, particularly on the labeling requirements, a public hearing can be expected.

**Time extensions for 33 direct and indirect additives—see page 66**


KESCO vital wheat gluten adds

PROTEIN
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VITALITY
to your sales

Today's consumers are "high protein" conscious. You can meet this demand for protein in your new products with the addition of small amounts of Kesco Vital Wheat Gluten to your formula.

Many food processors are also putting new life in established products by adding Kesco Vital Wheat Gluten. Such "renewed" products are often marketed at premium prices.

Kesco Vital Wheat Gluten has no taste . . . will not change flavor of original product. But, it does give you a strong new selling feature.

For samples, prices and more information on the many possible uses of Kesco Vital Wheat Gluten call or write:

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**plants companies personalities**

**Hilard L. Kravitz, M.D.**, has been named vice president of research by **Adolph's Ltd.**, Burbank, Calif., manufacturer of meat tenderizers, salt substitutes and sugar substitutes. Dr. Kravitz is a practicing physician and a member of the AMA, ACS, AAAS and Institute of Food Technologists.

H. L. Kravitz

Miller

**Dr. Paul G. Miller** has been named research director by **Adolph's Food Manufacturing Co.**, Burbank, Calif. He formerly was assistant research director of Thomas J. Lipton Company, Hoboken, N.J.

**Harold A. Bendixen**, vice president and general sales manager of **Clinton Corn Processing Company**, a division of **Standard Brands Inc.**, has been promoted to senior vice president and will assist President Roscoe C. Wagner in over-all management. **Reynold P. Jurgensen** will continue as vice president and production manager, but with increased responsibilities.

**DCA Food Industries Inc.** has appointed **Paul Khan** manager of its Central Research Laboratories. **Dr. Bernard Brachfeld** succeeds Khan as director of the company's Downyflake Foods Laboratory.

**Libby, McNeill & Libby** has made the following management changes in its research and frozen foods divisions: **Vincent E. Sweet** named manager of the frozen specialties department, frozen foods division; **Joseph W. Hanley** succeeding Sweet as an administrative assistant to the vice president in charge of research and quality control; **Dr. Gale R. Ammerman** succeeding Hanley as assistant director of


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Where pumps are a vital part of processing systems, powerful "K" Line Motorpumps are your economical and dependable choice. The "K" Line Motorpump—a recent development by Ingersoll-Rand—is easy to install, easy to service. It is designed with all the quality and performance engineered into the largest Ingersoll-Rand pumps. They're supplied in iron, bronze or special alloy to meet your specific needs. Other Motorpumps available through 75 hp for capacities to 3200 gpm, heads to 650 feet. Check into the advantages of the "K" Line by calling your nearby Ingersoll-Rand pump specialist. Or see your local I-R Distributor.

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I-R "K" Line Motorpump
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Heads to 190 ft.

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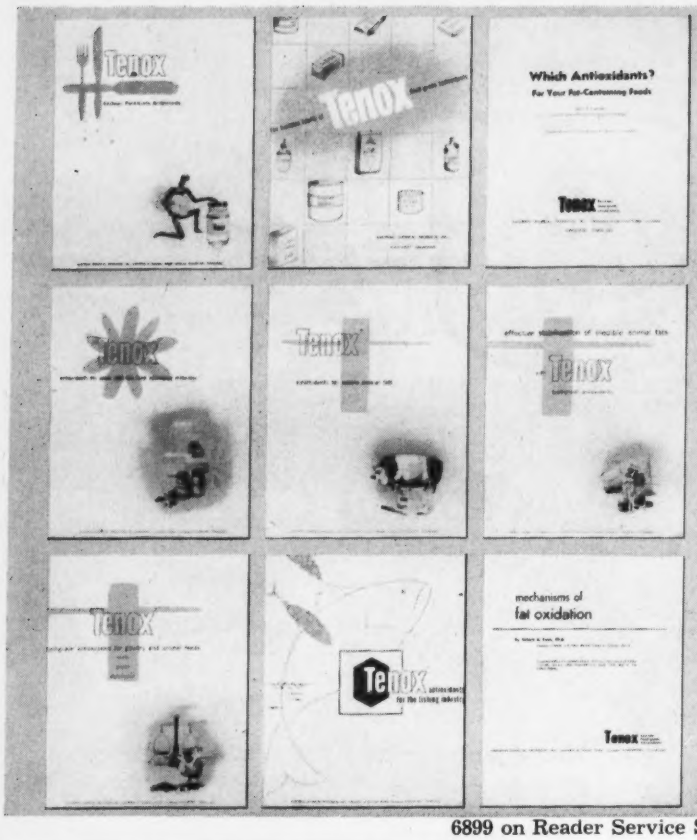


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- Tenox antioxidants for more effective food packaging materials
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- Effective stabilization of inedible animal fats with Tenox
- Tenox feed-grade antioxidants for poultry and animal feeds
- Tenox antioxidants for the fishing industry
- Mechanisms of fat oxidation

Eastman manufactures all the principal types of food-grade antioxidants in use today and supplies them in a variety of formulations. Because of this unique position we can suggest the antioxidant or formulation most effective for your product. Behind this service is a fully-equipped laboratory staffed with antioxidant specialists with years of experience in the food field.

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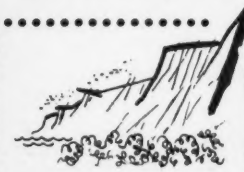

**GUM CARAGEEN** ... used as a stabilizer, emollient, demulcent; offers some emulsifying action. For ice cream, chocolate milk, creamed soups, syrups, sherbets, whipped cream.

**GUM ARABIC** ... its uses depend upon its action as a protective stabilizer, the adhesiveness of its water solutions, and as a thickener. Common in citrus oil emulsions, flavor emulsions, spray dried flavors, candies and jellies.

**GUM GUAR** ... an extremely versatile gum, Guar is used as a suspending agent, viscosity modifier, stabilizer, dispersant, selective flocculant. For cheese spreads, ice cream, salad dressings and sauces, desserts, processed meats.

For more information on these and other water soluble gums that Meer Corporation has assembled, assayed, processed and distributed since 1926, write for descriptive technical bulletin.

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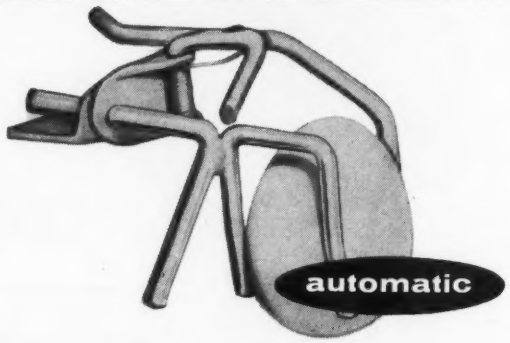


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It breaks at a speed of 18 cases an hour using only two operators. Eggs are never touched by hands.

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**plants companies personalities**

research in charge of the central food research laboratory at Blue Island, Ill. **Carl A. Selby** will manage the company's newly established frozen citrus department.

**Corn Products Company** has appointed **Emerson F. Schroeder** president of **Corn Products International,** succeeding James A. Moffett who has retired to become an executive consultant and company director. Schroeder heads an organization which maintains processing and packing facilities in 20 Free World countries. He is succeeded as Corn Products manufacturing head by Frank E. Glotfelty.

Schroeder

T. W. Biggs

**Thomas W. Biggs**, appointed an assistant vice president of the **Borden Company**, will serve as research products coordinator — continuing and broadening the liaison function in which he has been engaged since 1957. He will retain his current duties as assistant to the president.

**The Butter-Nut Foods Company**, Omaha, Nebr., roaster of America's fifth top-selling brand, has purchased the **Thomas J. Webb Company**, Chicago, a subsidiary of Continental Coffee Company.

**Dr. J. William Haun** has been appointed director of physical research at the Central Research Laboratories of **General Mills,** succeeding **L. F. Borchardt,** recently appointed managing director of the Laboratories. Dr. Haun will direct not only physical research, but also activities in the packaging, milling and mechanical engineering departments.

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OF PRODUCTS YOU NEED

**DELL DEHYDRATED POWDERS OR BASES**

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- √ VARIETY CHEESE FLAVOR BASES
- √ BACON FLAVOR BASES
- √ CHILI FLAVOR BASES
- √ ONION GARLIC POWDERS
- √ BAR-B-Q POWDERS
- √ BAR-B-Q POWDERS (used in baking)
- √ BAR-B-Q SAUCE MIXES
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- √ SPECIAL FLAVOR BASES
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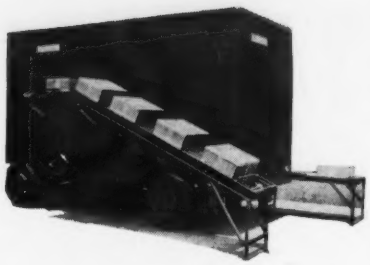


X-ray trailer is second built for Quartermaster Corps, and has completely new handling system, x-ray equipment, suspension and steering mechanism. Operator's compartment is air-conditioned enclosure with "inter-com" communication system

**Mobile fluoroscopy!**

# Canned and bottled foods inspected for damage without opening cases

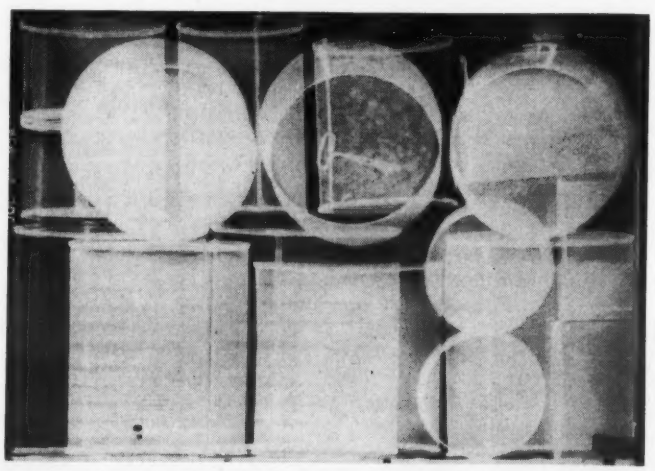
MOBILE x-ray subsistence inspection unit permits critical inspection of cartoned food products without damaging the cartons or their contents.

Unit is being used by the Army Quartermaster Corps for routine checks of (stockpiled) canned ration items. These food items must periodically be examined in event they are needed in a sudden emergency.

The x-ray trailer also has potential application in the commercial canning industry. Its mobile mounting permits transfer from warehouse to warehouse to inspect slow-moving cartoned stocks.

Another application, of an "emergency" nature, could be in checking suspected presence of foreign matter in a fresh canned pack, as in a recent situation where a canner received reports that some cans of corn contained ground glass.

Had a mobile x-ray unit been available, case-by-case



After lengthy storage, this field ration pack shows some internal deterioration — notably, gas bubbles in lower left can and lid swelling in can at top left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*(methyl and propyl esters of p-hydroxybenzoic acid)*

- Accepted as safe— under Food Additives Amendment
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- In addition to inhibitory action—can be bactericidal and fungicidal
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- Calcium or sodium salts available experimentally for increased water solubility
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Chemocides MK and PK, and their sodium and calcium salts, are immediately available. For additional data and samples write our Technical Service Department.

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• Use Flavorex Rum Flavor in *baked goods, confections, puddings, eggnog mixes, ice cream,* and other foods. You'll be doubly rewarded these ways . . . perfect for your present formulas . . . helps earn consumers' preference for your product.

• Flavorex Jamaica Style Rum is a flavor concentrate of natural and synthetic esters produced in our own plant and blended by our masters of the art. Run a batch test. You'll discover that every fragrant drop adds mellow tropical sunshine to your product. Write for free sample, or place a trial order today.

**Rum Flavor No. B224 . . . $12 per gallon**

Better Flavors for Better Products

**FLAVOREX CO., INC.**

302 S. CENTRAL AVE., BALTIMORE 2, MD.

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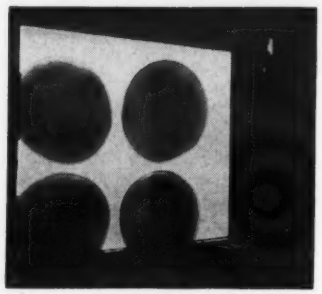
inspection of the 100,000-case pack could have been accomplished with a minimum of expense and with no unnecessary product loss.

### Semi-automatic operation

Basically, unit consists of an x-ray compartment and an operator's compartment — both enclosed within a specially built, lead-lined steel trailer. Operator is completely protected from radiation both by leaded walls and by the thick pane of leaded glass between compartments.

X-ray compartment contains x-ray generating unit, a movable 18 by 24 in. fluoroscopic screen, a powered section of roller conveyor and a remotely controlled special handling "fork."



In this inspection, fluorescent screen is positioned away from carton to enlarge image. Note roller conveyor section between screen and leaded-glass window

Once cartons are manually placed on the cleated steel-belt infeed conveyor leading into trailer handling is semi-automatic.

If initial fluoroscopic examination of contents reveals no can swelling, indentation, reduced liquid level, etc., operator sends carton out of trailer, via powered roller conveyor, through automatic exit door.

However, if quick examination indicates internal deterioration, operator remotely activates a special handling "fork" which permits inspection of contents at various angles up to 90° from original horizontal position.

### Low cost per hr

Inspection rate is 60 cartons per hr (one per min) when the "fork" tilt mechanism is not used, and approximately

*Sheftene Sodium and Calcium Caseinates* improve the quality of your product line in either, or both, of these basic ways:

I

SHEFTENES are a source of high-quality milk proteins, with an abundance of lysine and tryptophane. As such, they are unsurpassed for improving the protein quality of foods—wheat and grain products particularly.

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SHEFTENES are versatile *functional* ingredients. They are used — efficiently and economically — to enhance the texture, appearance and shelf-life of bakery, cereal, dairy, meat products, beverages, infant foods and many others.

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40 cartons per hr when this is needed.

Unit will handle cartons ranging from one lb in weight and 4 by 4 by 6 in., to 100-lb weight and 15 by 16 by 20 in.

Operating cost is approximately 50c per hr, based on 10c-per-hr power cost and 40c-per-hr x-ray tube cost ($7000 x-ray generator equipment, amortized over five yr).

(Mobile x-ray subsistence inspection unit was designed and built for Army Quartermaster Corps by General Electric Company, X-Ray Department, 4855 W. Electric Ave., Milwaukee, Wis.)
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### Highlights paper usage according to poultry act

Poultry Products Inspection Act became law in August 1957, and became mandatory January 1, 1959. Reference to act, as it concerns wrapping, handling, and identification is made in four-page folder.

Authored by Dr. C. D. Carpenter, former president of the Institute of American Poultry Industries, literature details some of the legal specifications of the act with regard to usage of paper.

Requirements of act in regard to when, where and how labels are to be used, and which inks may be used in printing are presented.

Brochure points out that even if legal requirements did not exist, high quality wrapping paper would still be needed to protect product and preserve its sales appeal.

(Copies of folder, "Poultry Products Inspection Act — some comments concerning its effect on poultry and paper," may be obtained from Riegel Paper Corporation, 260 Madison Ave., New York 16, N.Y.)
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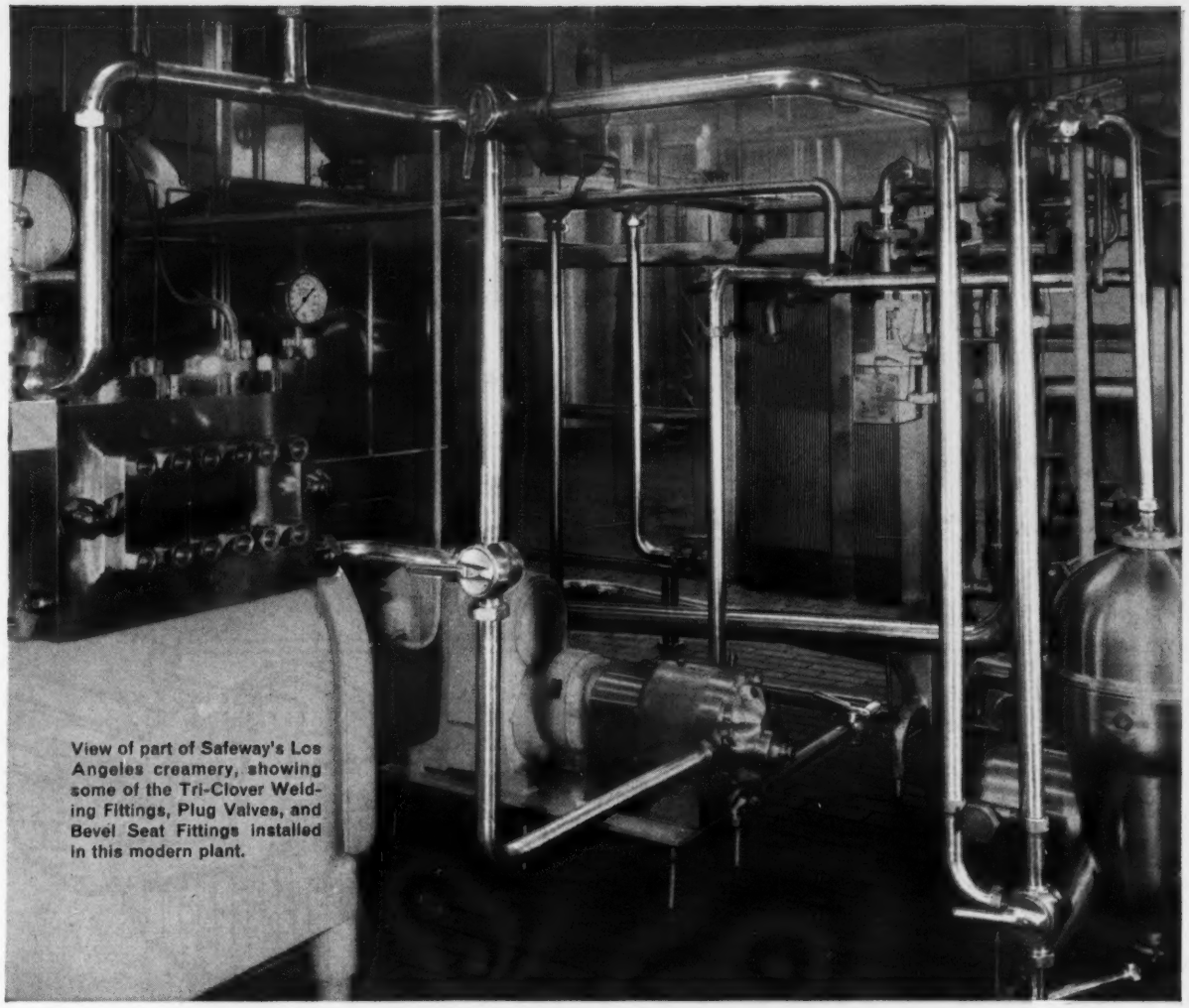
**Special opportunities for you in the Classified Advertising section, page 124**

View of part of Safeway's Los Angeles creamery, showing some of the Tri-Clover Welding Fittings, Plug Valves, and Bevel Seat Fittings installed in this modern plant.

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### utilizes TRI-CLOVER WELDING FITTINGS and VALVES

Safeway Stores have long been known for modern self-service retailing and efficient operations. In keeping with these progressive methods, their modern creamery in Los Angeles, California, was carefully designed for "streamlined" processing.

As part of its flow design, Safeway installed numerous butt welded stainless steel liquid lines where Tri-Clover "TRI-WELD" welding fittings were used, together with Tri-Clover Plug Valves for directional control in this plant.

Welding on these lines was done right on the job, with newly developed welding machines.

This is another good example of the way in which Tri-Clover fittings and valves "keep pace" with modern processing methods that are being developed by the country's leading dairy and food plants. Let our engineering department help plan your next processing or "C-I-P" installation.

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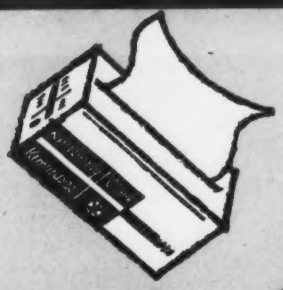

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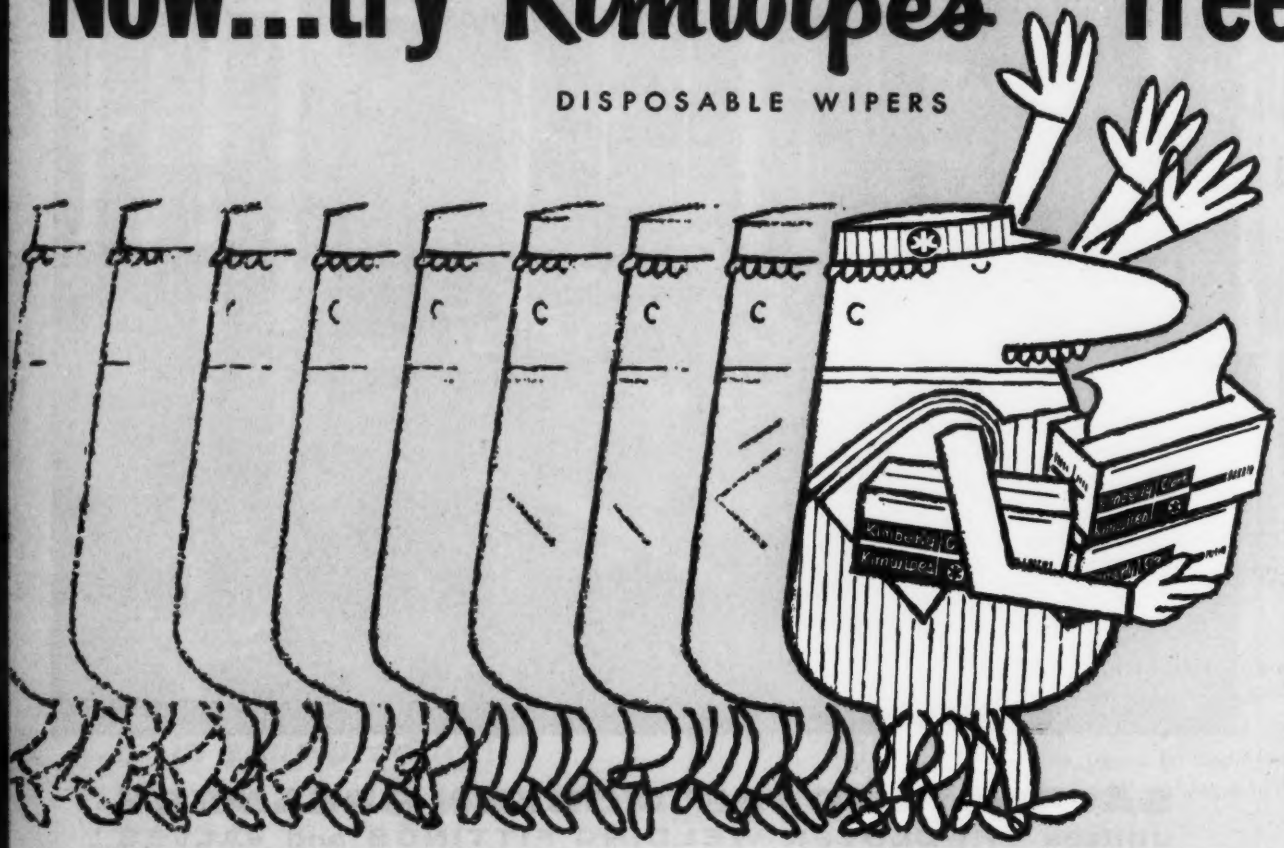

Mail the coupon *today* so that we can rush you your FREE box of 100 Kimwipes disposable wipers. Try Kimwipes in your plant to prove to your own satisfaction that they perform better than cloth towels in food processing operations.

Use Kimwipes for quick, thorough absorption of shortening oils and grease. Use them *wet* for easy removal of sticky frosting, syrups, sugar and flour from workers' hands and machinery. Use both *wet* and *dry* for keeping equipment clean and sanitary. Available in handy pop-up packages or metal wall dispensers.

Super-sanitary Kimwipes pay for themselves in savings on towel laundering, alone!

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Please send me my FREE package of Kimwipes disposable wipers, "900-L."

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For more information on product at left, circle 6909 see information request blank opposite last page.

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
APRIL 1960
VOL. 21 NO. 4

**Points of reference . . . and a suggestion for preventing recurrences of irresponsible acts by the HEW Secretary in . . .**

# The Fight for Sanity in Food Safety

**HOWARD P. MILLEVILLE,** EDITOR

How do we expose the distorted interpretations of scientific fact which are being levied against the food processing industry in increasing intensity?

What are the basic points of reference to which we should refer those interested in securing an objective viewpoint on sanity in food safety?

Consider the latest sensational presentation of half truths on our food supply in the book — *The Poisons in Your Food* (Simon and Schuster, NYC, Feb 28 1960). Taken at its face value, it is a damning indictment of the food industry, food technologists, toxicologists, and industrial chemists.

The author, William Longgood, is a New York newspaper man. In this new book he reports on what purports to be an exhaustive research he made on what has happened to food.

Obviously, the book is a biased presentation . . . but a frightening one to the consumer. While it does embrace ideas of groups generally recognized as faddists, it would appear to be too well documented* to be dismissed lightly.

The basic thesis of *The Poisons in Your Food* is the old familiar argument that poison is still poison no matter how small the dose. But it is presented with renewed force.

How do we answer such arguments to the satisfaction of the layman — the public which buys and consumes our products . . . the Congress which makes our laws?

First, the layman ought to have some understanding of the tests presently required to demonstrate the safety of an additive, for the implication is, that if any substance does not meet these tests it is poisonous.

The fact is that if normal components of our diet had to undergo the same test procedures required of additives, each of them would come to be judged harmful in one respect or another and therefore poisonous.

If you encounter any disbelievers of this last statement just ask them (1) to pick out any single normal component of his diet, then (2) to consume it at 100 times the expected intake . . . at each and every meal . . . over a lifetime.*

Certainly one basic point of reference is this: **There are no harmless substances; there are only harmless ways of using substances.**

That there are "safe" levels of intake for each substance is an established toxicological principle.

A corollary to this principle permits the ignoring of the presence of known traces of chemicals in foods as though none were present. An amplification of this point will be found in the Food Protection Committee's statement which is presented on the next page.

Another basic point of reference: **Whether or not a particular substance is safe for use in food is a decision requiring scientific judgment.**

These two points of reference are, in fact, the basis of the 1958 Food Additives Law . . . except for the Delaney cancer clause.

The Delaney Clause as it now has come to be enforced by FDA under Flemming is a triumph of superstition over science. In effect, it has come to mean that if any substance could be suspected of causing cancer, those who want to use it must prove that it cannot do so even at the highest conceivable level in the diet of a test animal.

Superficially that sounds like scientific conservatism. But it is neither scientific or logical because it requires proof of a negative.

Much to the gratification of Delaney and all the anti-cancer faddists, the statutory language in the Delaney clause has been administratively distorted to require proof that a substance which has not been found to induce cancer cannot in fact cause cancer.

In practical terms this means that a suspicion by a government official can be substituted for a scientific observation. This has already happened.

Those who support this position of the FDA masquerade as the champions of public safety, protecting the consumer against the emotionally upsetting disease cancer. So well have they played on the fears of the unknown in connection with this dreaded disease, that the public has generally come to support their position.

It thus becomes necessary to amplify somewhat the last point of reference we established, as follows: **Whether or not a substance will cause cancer in humans is a decision requiring the best possible scientific judgment.**

Otherwise we are faced with the incongruous situation of having to classify substances as carcinogens on the basis of suspicions or requirements that even our most staple foods (milk, honey, sugar, eggs, coffee, tea, . . . to name a few) cannot pass.

Our position is that thusfar the government has not made use of the best possible scientific judgment available. Just what constitutes the best possible scientific judgment will be the subject of an article scheduled for next month.

### A strong FDA a must!

At this time we introduce what we consider another basic point of reference: **Essential to public confidence in our food supply is a strong food and drug enforcement agency.***

But it must be an agency whose

*The numerous literature citations throughout the book will very likely impress the casual reader; however, when investigated they become a list of some of the phoniest food faddists in the country.

*The factor of 100 is quite common to presently accepted toxicological test procedures. In these procedures the substance is first fed to test animals in sufficiently high doses to deliberately produce injury. Information on the nature of the injury thus obtained is helpful to the toxicologist in determining the "no-effect" level of feeding. Then, the "safe" level of feeding is typically taken as a 100th of the "no-effect" level.

*This point follows as a corollary to the principle that public confidence in processed foods is the food industry's prime responsibility — see commentary on page 28.

enforcement commands the respect of scientists, and thus in turn, the respect of the regulated industry.

Prior to Flemming we had such an agency. But his failure to exercise reasonable judgment in enforcing the Food Additives Law under Section 705(b) has thrown the industry into a state of confusion.

Sec 705(b) includes the following provision:

"The Secretary may also cause to be disseminated information regarding food, drugs, devices, or cosmetics in situations involving, in the opinion of the Secretary, imminent danger to health, or gross deception of the consumer . . ."

Consider the Secretary's handling of the cranberry incident. Apparently his scientific advisors held the view that the weedkiller aminotriazole has the potential to cause cancer when ingested by humans. Therefore, under the Delaney Clause as presently interpreted by the FDA, any food containing it must be seized.

About one per cent of the cranberry crop was found to be contaminated with aminotriazole. The level of contamination was about one tenth of one part per million. Despite this trace level of contamination, the FDA proceeded with seizure.

FDA had the right to seize contaminated cranberries; Secretary Flemming had the right to announce the possibility of contaminated cranberries being on the market *if in his opinion* there was "imminent danger to health".

But just how imminent was the danger to health?

Results of toxicity tests which the manufacturer of aminotriazole reported to FDA have not yet been published. However, based on these tests it has been reported that aminotriazole possesses no action that is in any way different from that of numerous other thyroid-inhibiting agents.

A number of such agents have been used in human medicine for the past sixteen years, and many of them occur naturally in milk, cabbage, kale and other common foodstuffs in concentrations hundreds of times greater than the level of aminotriazole in the contaminated berries.

Furthermore, it has been known for many years that various thyroid-inhibiting compounds are capable of causing tumors of the thyroid in rodents if fed in relatively high dietary concentrations over substantially the lifespan of the animal.

There is no general agreement among the experts that such tumors are actually cancers; in fact the great weight of scientific opinion would appear to be against such an interpretation.

If thyroid-inhibiting compounds really were carcinogenic and so potent as to constitute a real hazard, thyroid cancer would be epidemic among peoples of the world as a result of the naturally occurring thyroid-inhibiting substances.

The implication that the inadvertent consumption of a small fraction of one part per million of aminotriazole in an occasional serving of cranberries subjected the consumer to a risk of cancer would therefore appear to be utterly fantastic!

It is therefore concluded that the usual remedies available to the Secretary for removal of the contaminated cranberries were adequate. It is also concluded that to have resorted to a press conference was irresponsible administration.

Various suggestions have been made with the objective of preventing recurrences of such irresponsible acts on the part of the Secretary. The one we offer would not in any way limit his authority, but would place any action he takes under Sec. 705(b) in a scientific perspective. We propose that this section be amended by addition of a statement somewhat as follows:

"Such information which the Secretary disseminates must include statements of opinion which he obtains from individual members of the National Research Council's Food Protection Committee as to the degree of hazard. If these additional statements cannot be had at the time the Secretary first calls the public's attention to the hazard, then they should be publicized by him as soon thereafter as possible."

We contend that when the public is informed of a hazard about which there may be widespread disagreement among scientists, this disagreement of opinion as to the imminence of the hazard should be part of the story.

# Insignificant Leve

## THE FOOD PROTECTION COMMITTEE

**The National Research Council established the Food Protection Committee as a committee of its Food and Nutrition Board in 1950 to serve as a fact-finding and advisory body for government and industry. The members serve without compensation.**

ITS PRESENT MEMBERSHIP:

WILLIAM J. DARBY, M.D., *Chairman*: Head, Department of Biochemistry and Director, Division of Nutrition, Vanderbilt University School of Medicine, Nashville 4, Tennessee.

DAVID B. HAND, *Vice Chairman*: Division of Food Science and Technology, State Agricultural Experiment Station, Geneva, New York.

PAUL R. CANNON, M.D., Department of Pathology, University of Chicago, Chicago, Illinois.

HERBERT E. CARTER, Head, Department of Chemistry and Chemical Engineering, University of Illinois, Urbana, Illinois.

J. M. COON, M.D., Professor of Pharmacology, The Jefferson Medical College, Philadelphia, Pennsylvania.

GEORGE C. DECKER, Head, Economic Entomology Section, State Natural History Survey, and Illinois Agricultural Experiment Station, Urbana, Illinois.

ELLIOTT A. MAYNARD, Associate Professor of Pharmacology and Toxicology, School of Medicine and Dentistry, University of Rochester, Rochester 4, New York.

EMIL M. MRAK, Chancellor, University of California, Davis, California.

R. BLACKWELL SMITH, JR., President, Medical College of Virginia, Richmond 19, Virginia.

HENRY F. SMYTH, JR., Mellon Institute of Industrial Research, Pittsburgh 13, Pennsylvania.

# Levels of Chemical Additives in Foods

**An official statement by the Food Protection Committee of the National Research Council***

Chemicals are used in various phases of food production and technology. Those that occur in the food as the result of such use are termed "chemical additives." The regulation, in the interest of public health, of the extent of occurrence of these chemicals in food is based in part on the established toxicologic principle that there is a "safe" level of intake for any chemical.

An additional principle, which has not been generally recognized or, in fact, stated, enters into such regulation. This principle permits the ignoring of the presence of known, finite quantities of chemicals in food as though there were none present.

There has been some tendency to use the term "zero" to include such finite, though ignorable, amounts. It seems preferable to recognize that these amounts are finite but that they are insignificant or inconsequential insofar as public health is concerned. The following is an attempt to develop this concept and state it formally.

The effects of chemicals are generally related to the quantities that enter the body, whether single or repeated doses are administered. A typical dosage-response relationship as progressively smaller quantities are administered is: (1) rapid death, with few or no characteristic pathologic effects; (2) delayed death or survival with marked characteristic effects of the compound; (3) slight injurious effect; (4) no discernible effect.

Occasionally, a seemingly beneficial effect may occur at even lower levels.

All compounds that have been studied display changes in degree and nature of effect as decreasing amounts are administered to animals. All pharmacologic actions are reduced by decreasing the intake. Whenever dosage-response curves have been plotted, they have indicated that the discernible response reaches zero while the dosage is still finite.

From the public-health point of view, it is fortunate that this is true, because even unprocessed foodstuffs and drinking waters may contain traces of many substances which would be harmful in large amounts. For example, studies by sensitive analytical methods have revealed the presence of many metallic compounds in unprocessed food and water at levels of parts per million.

Furthermore, food cannot be produced without the presence of a wide variety of materials resulting from decomposition; the action of micro-organisms, insects, and other pests; and contact with tools and containers used in production and processing — whether industrial or domestic. These materials can be reduced in amount by increased care to prevent contamination, but they cannot be avoided entirely.

In fact, to prepare foodstuffs sufficiently free of these materials to be suitable for use in experimental diets for critical nutritional studies is a major undertaking. Unless present in excessive amounts, incidental contaminants are accepted by both the pharmacologist and public-health official as inconsequential in relation to public health.

For every compound there is a level of intake below which there is no discernible effect upon health. In toxicologic testing, a level of intake of a compound having no demonstrable effect upon at least two species of animals when fed over a long period is generally referred to as a "no-effect level."

Extrapolation from the "no-effect level" in animals has been successful in defining a level of intake which has a negligible probability of injuring any individual in the population. This level is commonly referred to as the "safe level" for use by man.

Even though it is based on the best available quantitative biological information, the establishment of safe "safe level" is a subjective mental operation. This operation takes into account the experimental data, particularly the nature of the injury from an excess and the variation of injury with variation of intake.

Further, it interprets the significance of doubtful observations and allows for the variability of species and individuals. Last, it applies a margin of safety to compensate for factors which cannot be accurately evaluated. The subjective nature of the judgment upon which the "safe level" is based inevitably confers some small uncertainty to the estimate. Thus, it is appropriate that regulatory safeguards be applied to prevent more than the "safe level" from reaching the diet.

The use of chemicals in food technology results in the incidental presence of foreign substances in foods. When the maximum amount, either as calculated from its proposed technologic use or analytically determined, of such a substance is sufficiently below the "safe level," the probability that injury will result from its presence approaches zero.

Such a level, which can only be evaluated by a qualified expert, is certainly within the zone of toxicologic inconsequence.

To define exactly the upper limit of the "zone of inconsequence" or insignificant level of any material would require experiments using infinitely sensitive criteria of functional effect. No such criteria exist.

Experiments can demonstrate the absence of effects of some particular recognized magnitude; they cannot demonstrate the absence of any effect at all. However, if adequate toxicologic data exist, those qualified by training and experience can judge whether a proposed intake is within the zone of inconsequence.

If a reasonable extrapolation of the dosage-response curve shows the proposed intake to be far below the lowest intake that can be expected to produce an injurious effect, the proposed intake is within the zone of inconsequence; insofar as public health is concerned, regulatory action concerning it would be neither helpful nor necessary.

Each application of a chemical should be considered on its own merits. An arbitrarily selected fraction of the "safe dose" should not be used to define the upper limit of a zone of inconsequence for all materials; rather, due regard should be given to the severity of injury which can result from an excess and to the slope of the dosage-response curve.

Judgments regarding safety should be conservative. When a proposed application results in a potential intake so close to the "safe level" of the material that it is not clearly within the zone of inconsequence, then regulatory control is indicated.

**Conclusion — It is recognized that, as the result of use of chemicals in food production and processing, substances may occur in foods in amounts so small as to be inconsequential in relation to public health. In such instances, regulatory action is not required.**

*This statement appears in the December, 1959 edition of PRINCIPLES AND PROCEDURES FOR EVALUATING THE SAFETY OF FOOD ADDITIVES. It orignally appeared in *Food Drug Cosmetic Law Journal*, and is reprinted here by permission.

# FDA's new leaflet does topnotch job of explaining need for additives

**HOWARD P. MILLEVILLE,** Editor

THE food industry's job of educating and continually reeducating the public on the need for additives has been given a tremendous boost by the Food and Drug Administration's new leaflet.

In announcing the new publication, George P. Larrick, FDA Commissioner, said: "We should not lose sight of the fact that food additives are an integral part of the tremendous progress being made in modern food technology, and that they are being used for a host of purposes that are beneficial to the consuming public."

Congratulations to Mr. Larrick for a job well done! *This booklet does more to defend the food industry's use of additives than the food industry has done on its own behalf.*

It is now time the food industry recognized that its growing use of chemicals is a most compelling reason for it to sponsor and support a program of educating the public on this use.

We will pursue this subject further in next month's issue.

This excellent booklet concludes with two statements which have a somewhat erroneous implication. After pointing out that chemical names for even the most harmless additives often appear formidable and dangerous simply because they are long and difficult to pronounce, the leaflet concludes:

"And you may now be assured that if the chemical named on the label has not been tested for safety, the Food and Drug Administration can do something about it. There is a law!"

Our commentary on these last two statements appears in the box below.

## *Contents of FDA's new leaflet on additives*

**FDA's attractive new leaflet on additives which is reviewed on this page cover the following topics:**

**Chemicals in foods not new**
**Food chemistry aids progress**
**Public health safeguards necessary**
**A new law for consumer protection**
**How the new law works**
**What are some of the common food additives**
**Special classes of additives—pesticides and coal-tar colors**
**Label declaration of food additives**

**This attractive 16 page leaflet is available from the Supt of Documents, US Govt Printing Office, Washington 25, D.C. Price 15 cents. Ask for Leaflet No. 10. HEW, FDA.**

## *An added commentary**

**by HOWARD P. MILLEVILLE, Editor of FOOD PROCESSING**

The last two statements of this excellent booklet need some amplification. They imply that before the passage of the 1958 Food Additives Law the Food and Drug Administration could do nothing about any additives untested for safety by industry.

As pointed out on the third (white) page of this booklet, FDA could act, but there would be a time delay until FDA conducted tests to prove they were unsafe—a procedure taking up to two or three years. Now FDA can act swiftly without itself having to make any tests.

These statements also imply that some of the chemicals listed on labels of food products are unsafe. To the extent that they have this implication, they are misleading.

Now that we have a Food Additives Law, it is most unlikely that any food manufacturer would list on his label any additive unless prior approval is secured from FDA. Hence, *the consumer can assume without any risk that all the chemicals listed on the label of a food product are safe.*

There is a Food Additives Law! In a very real sense, elimination of the fear that possibly one of the chemicals listed on food labels is unsafe was the prime purpose of this Law.

*Not to be construed as being part of this leaflet as published by the FDA

# The creeping hysteria of FOOD AND FALLOUT

## PART II — STRONTIUM 90 AND FOOD

KARL ROBE, Associate Editor

Of all the radioactive elements released by nuclear explosion strontium 90 has received the most publicity. It is long-lived, (half-life 28 years) and is taken up by the bones of animals, including man, along with calcium.

Its radiation comes from beta (electron) ray emission. In contrast to the penetrating power of the gamma rays of x-ray diagnosis and natural background radiation, beta rays have a short range -- approximately ⅛ of an inch in body tissue.

Since the gonads are protected from exposure to the strontium 90 in the bones by more than ⅛th of an inch of body tissue, strontium 90 in the bones is not considered a significant genetic hazard.

On the other hand, radiation (either beta or gamma) in large enough doses can cause cancer and leukemia. Therefore, collecting strontium 90 in our bones is not a pleasant prospect.

Another unpleasant consideration is that our children are more susceptible to the possible hazard than we are. Formation of bones in childhood adds calcium at a faster rate than during adulthood.

With this prospect of increasing amounts of strontium in the bones, what are the hazards of increased bone cancer and leukemia? The general answer is: We do not know.

By projecting the data from known radiation-induced diseases and from Hiroshima-Nagasaki survivors, Dr. E. B. Lewis of California Institute of Technology concludes that an estimated 1600 deaths per year may result from strontium 90, throughout the world population. He estimates 8000 deaths per year from leukemia, world-wide.

Whether or not these estimates are high or low depends on some unanswered questions. One is the previously discussed question of threshold (see Part I).

Another: Will the accumulation of strontium 90 in specific bone areas have a more significant effect toward increasing bone cancer and leukemia incidence?

Various public agencies are stepping up their studies on the strontium 90 content in foods. What significance do these reports have to food processors?

Accumulated over a long-term period, these reports will give scientists valuable data about fallout distribution and the dietary amounts of radiation to which we are exposed.

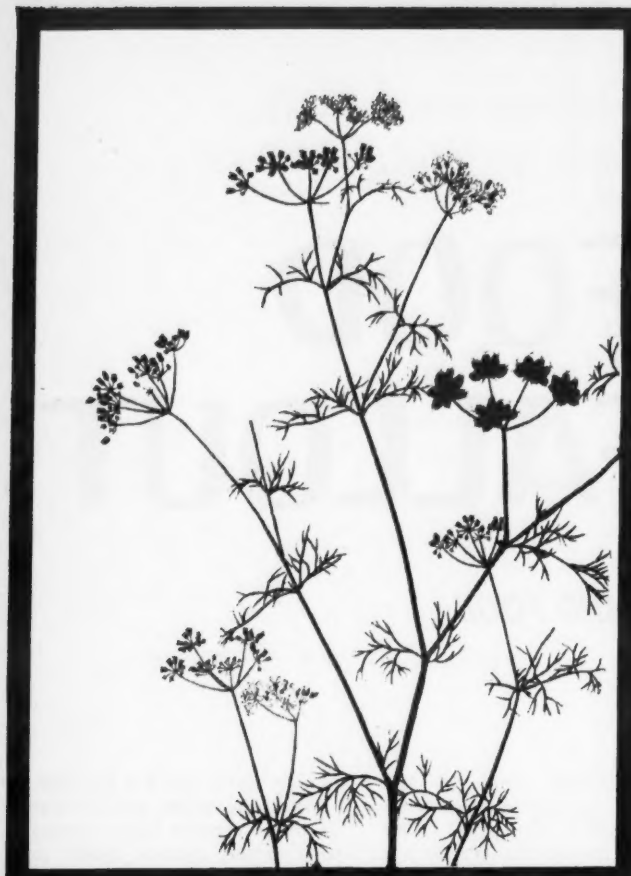
Over the short term, some of these reports have tended to impeach certain foods in the public mind. Adverse implications result when a few samples occasionally show higher values than present maximum permissible concentrations. News stories play up these out-of-range readings in headlines because they can be dramatized.

The AEC has found that unusually high readings reported in air and water samples in California in 1958 (and termed "Deadly Radioactive Rain" in some news reports) were of transient nature.

**An added commentary by Dr. Linus Pauling, outspoken foe of nuclear testing, will be found at the end of this article.**

Later tests showed observed concentrations of strontium 90 and other long-lived isotopes in California are actually below the US average.

An intensive study in the North Dakota region, where high readings in milk and wheat have been given the headline treatment, shows that the total amount of strontium 90 in the soil to date is equal to the average



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for the US as a whole.

Again, high readings for some samples have apparently been temporary, short term fluctuations.

How can the imputed criticisms that arise in consumer minds as a result of headline treatment be answered by food processors?

First and foremost, we cannot belittle strontium dangers. Fallout fears are valid fears, and deserve considered attention.

In public or private statements on strontium 90 hazards in foods, a positive, factual approach can be taken. It can be pointed out that:

1. Most scientists agree: Strontium 90 in our bones is not an important hazard to our heirs.

2. If a threshold does exist, then figures on estimated bone cancer and leukemia deaths will become appreciably less than the estimated figures of up to 1 to 3 deaths per million people from both causes . . . approaching zero.

(to be concluded next month)

## No Threshold For Genetic Damage

**Dr. Linus Pauling comments on Part I of Food and Fallout, published last month**

As the April issue went to press, a 5-page critique of the **Food and Fallout** series, previously sent for review, was received from Dr. Linus Pauling of California Institute of Technology, outspoken foe of nuclear testing.

Space limitations do not permit publishing the entire letter. He makes several important points:

". . . anyone reading your article would get the idea that there is a possibility that there is a threshold for genetic damage, as well as for cancer production. . . . it is known that there is not a threshold for genetic damage."

Statements applying to possibility of a threshold in Part I should have been confined to leukemia and bone cancer deaths, and the genetic question considered separately.

Dr. Pauling points out,

(*Continued on page 32*)

*that's interesting*

**Heavenly hash**

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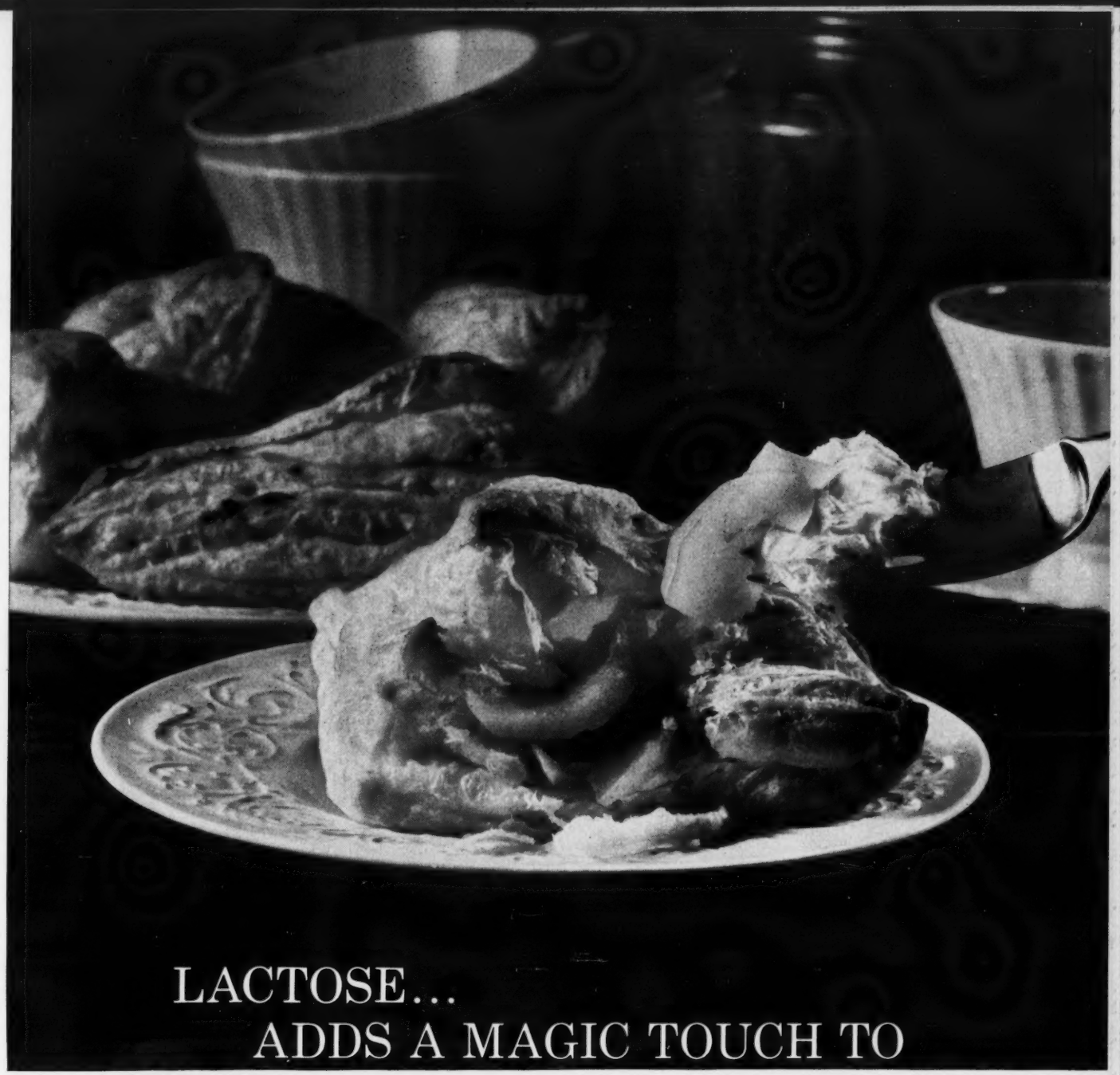

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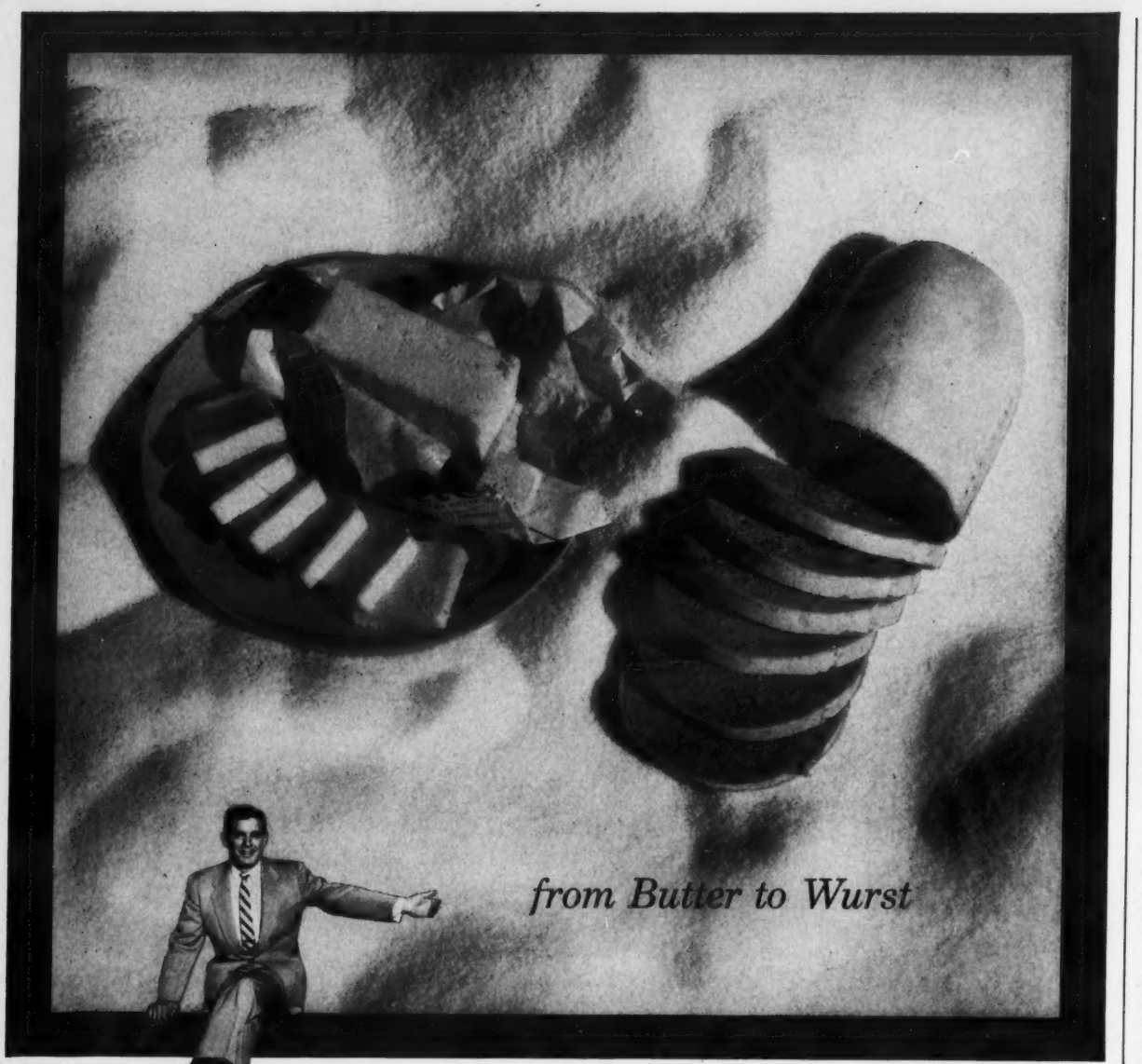


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Diamond Crystal Salt combats danger of spoilage, enhances and improves the taste of your product. The presence of calcium and magnesium in a less pure salt could form unappetizing scums and discolorations in some canning processes. In other types of foods, copper and iron in the salt could foster oxidative rancidity, especially in foods containing fats and oils.

All salt is not alike. Diamond Crystal's exclusive Alberger process produces a flake-type salt that is 99.95% pure. This high purity eliminates salt bitterness, thus resulting in best flavor development of your product.

Diamond Crystal Salt Co.'s staff of trained food specialists are available to assist you in selecting the correct grade or type salt for your product. For more information, call the nearest Diamond Crystal sales office or write to Diamond Crystal Salt Co., St. Clair, Michigan.

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## Genetic Damage

(*Continued from page* 30)

". . . you say that many scientists disagree about effect of radiation on genes.

"This statement, as written, may be strictly true, but I doubt that many of your readers would interpret it in the correct way . . .

"It is known that repeated small doses of radiation cause mutations, and that a single large dose of radiation causes mutations. There is, however, evidence that in some cases repeated small doses do not cause the same number of mutations as a large dose of equal total amount.

"The repeated small doses have been found, under certain circumstances, to cause only one-half or one-third as many mutations as the large dose, but in other circumstances to cause more mutations than the large dose. The uncertainty on this point is only a part of the general uncertainty as to exactly how many defective children can be expected to be born as a result of fallout radioactivity."

Dr. Pauling notes that the figure "200 milliroentgens" applied to fetus exposures, 2nd column, pg 35, March FOOD PROCESSING, should have read "2000 milliroentgens."

Concerning the increase in cosmic rays with altitude, Dr. Pauling gives an average value of 15 milliroentgens increase at 5000 feet (range 7 to 23 milliroentgens as quoted from Dr. W. F. Libby), rather than 30.

Referring to part of the article which indicates that a threshold, if it does exist, offers some hope that leukemia and bone cancer death estimates may be too high, Dr. Pauling comments:

"This. . .represents the sort of unscrupulous statement that some AEC spokesmen have made. The argument is the following: We do not know with certainty whether small amount of radiation, background radiation plus fallout radiation, cause cancer. Therefore, let us be reckless about the health of the people, and assume that it does not cause cancer.

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protecting the health of the people. In this case, when there is a good probability that cancer is caused, then the health authorities should strive to control the source of the cancer-producing factor."

Dr. Pauling is in disagreement with the statement: "Fallout damage is a calculated, though as yet unproved, risk."

Editor's note: This conclusion in the article is based on statements by Dr. John W. Gofman, professor of medical physics, Donner Laboratory, University of California, Berkeley, and by Dr. John H. Lawrence, Director of Donner Laboratory, which studies the effects of radiation on man.

### Elements of boiler house operation

Suitable as a reference book, volume bridges gap between practical and theoretical problems arising in boiler house operation.

Among main topics covered are boilers, boiler auxiliaries, water treatment, formation and properties of steam and fuels. There are also chapters on combustion calculations, fuel and flue gas testing etc.

Calculations presented have worked-out examples and photos and diagrams illustrate equipment and test apparatus.

("Fundamentals of Boiler House Technique," 164 pp., by P. D. Dehnel, is available for $4.50, from The Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N.Y.)

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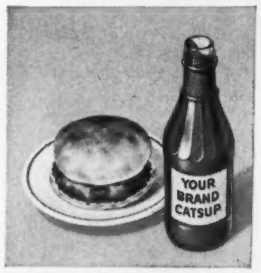
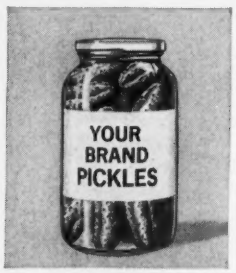



**In catsup,** Sweetose holds that "fresh-pack" rich red color. Enhances flavor. Improves gloss and sheen.

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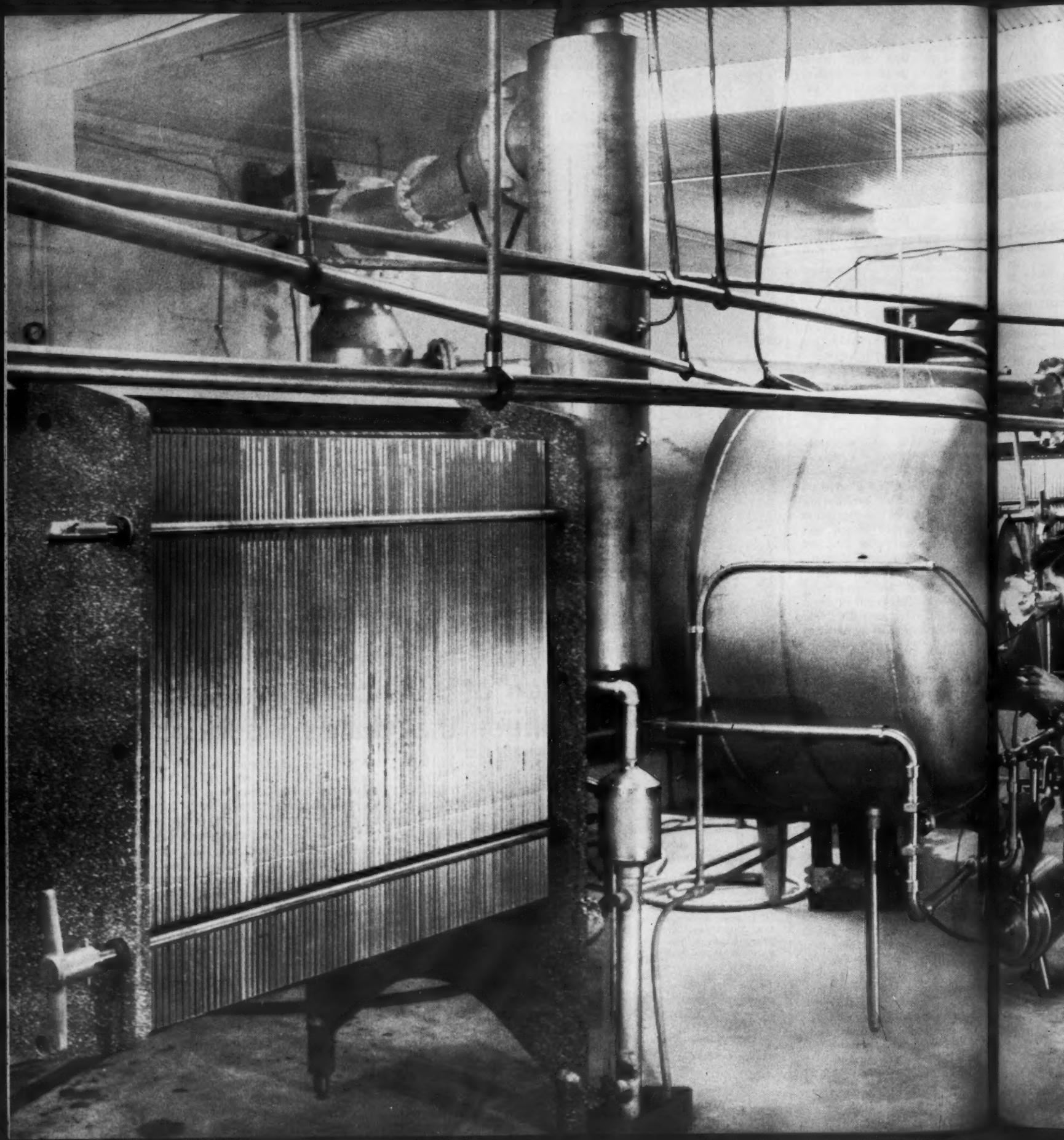
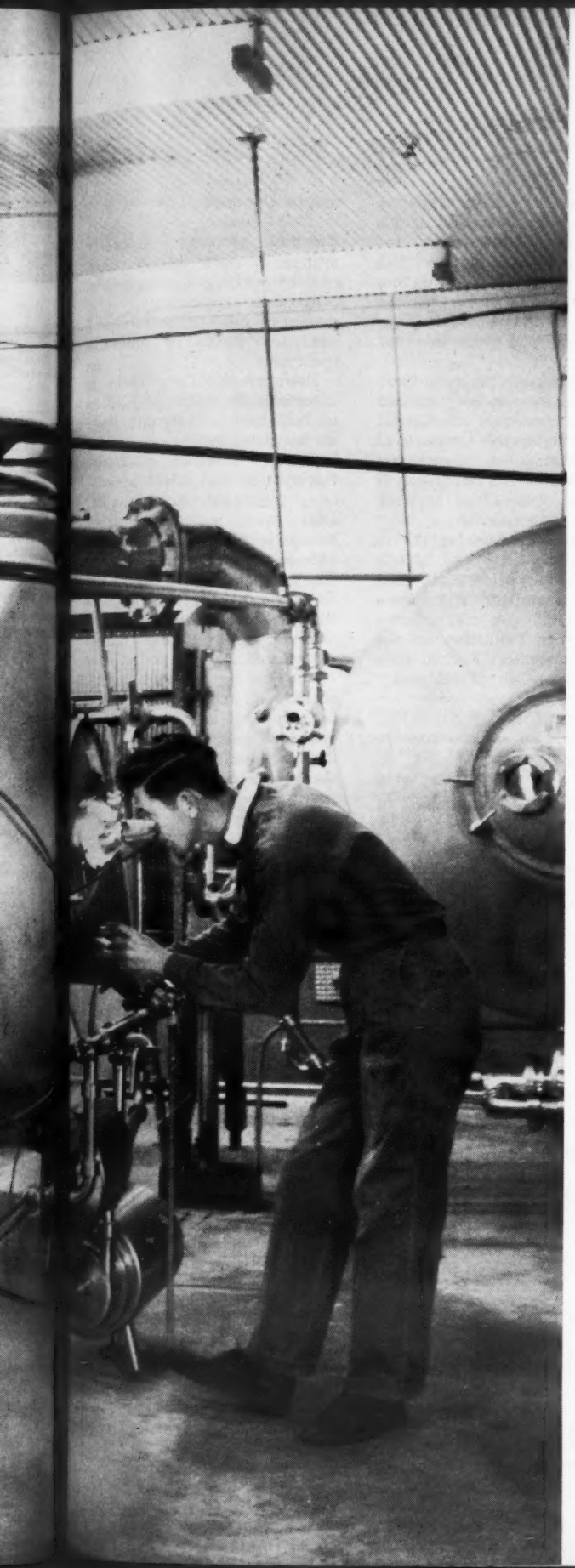




View of double-effect plate evaporator installation at Snively Groves, showing 1st effect and horizontal cyclone separator in foreground. Capacity: 13,000 lbs water evaporated per hour

# REVOLUTIONARY PLATE EVAPORATOR

- Throughput so rapid — 30 to 75 seconds — that higher operating temperatures can be used than with conventional evaporators for a high-quality concentrated orange juice
- Overall height is under 9 feet, and no supporting super structure or special building arrangement is required.

**William W. Giddings**
Vice President, Development and Research
Snively Groves, Inc., Winterhaven, Florida

**Howard P. Milleville**
Editor

In the last fifteen years, the art of economical, low-temperature, vacuum evaporation on a commercial scale has had its biggest impetus in the production of orange juice concentrate.

It is therefore especially noteworthy to observe how well the new plate evaporator has performed in its first installation for orange concentrate at Snively Groves in Winterhaven, Florida.

Holdup volume of the plate evaporator is so low when operating that throughput time is only 30 to 75 seconds. As a result of this rapid evaporation process, higher evaporating temperatures can be used for producing the same quality of concentrate with corresponding savings in equipment as well as in operating costs.

The first runs on orange juice at Snively Groves were made on a pilot-plant model of the evaporator at the tail end of the 1959 juice season. Results were so successful that a production unit was ordered and installed.

This production unit, which has an evaporating capacity of 13,000 lbs water evaporated per hour, was placed in operation the first of the year.

It is a double-effect system with vapor recompression on the first effect, and achieves an evaporation of approximately 2.5 lbs of water per lb of steam.

Evaporating temperature in the first effect is 165 F, and in the second effect, 120 F. Details of the operating conditions are given in the schematic flow diagram on the next page.

Taste panel tests have shown that concentrate from the plate evaporator when flash cooled to 80 F has neither a cooked odor nor taste. It was judged slightly supe-

## REVOLUTIONARY PLATE EVAPORATOR continued

rior to that produced from the same raw juice in conventional tubular evaporators operating at much lower temperatures, i.e., at 58 to 85 F but where the throughput time is several hours.

A slightly cooked odor judged not objectional for concentrate to be used as base for blends, is obtained when the flash cooler—see flow diagram—is not used.

In the flash cooler, the concentrate from the second effect at 27" Hg vac and 120 F is flashed into a small (14" dia) chamber maintained at a vacuum of 29" Hg. Temperature drops to 80 F and the concentrate is discharged from the system to the blending tanks.

**New evaporating techniques:** the plate evaporator differs from the conventional evaporator in that the tubular calandria, where heating and boiling take place, is replaced by a specially designed, compact plate heat exchanger.

Thin stainless steel plates are arranged face to face with the juice and steam heating medium on opposite sides. Distance between plates is somewhat larger than when used for heat exchange with no evaporation.

Routing of the juice through the plates is arranged so that it travels from a juice inlet header up between one set of plates (rising-film subsection), then down between another set of plates (falling-film sub-section) and out through the enlarged juice and vapor outlet header to the separator.

Feed liquid entering the base of the rising-film section boils on contact with the heated plates, rises to the top and transfers to the falling-film section where boiling is completed.

One complete section of the evaporator is shown in the accompanying diagram. The number of these complete sections can easily be changed to provide for wide variations in capacity of a given installation.*

Concentrated product from the plate evaporator, together with its vapor, is discharged into the separator, which is of the cyclone or centrifugal type. Axis of the separator is horizontal instead of vertical, thus saving headroom.

When concentrating to a higher ratio than 4 to 1, it is necessary to recirculate part of the concentrate in the second effect to maintain a wetted-wall condition in the plate evaporator. For 60 Brix concentrate, up to 30% recirculation is used.

**Control** of the evaporator system is quite simple. Two of the operating conditions are controlled automatically by means of float-valve mechanisms, and three are manually controlled.

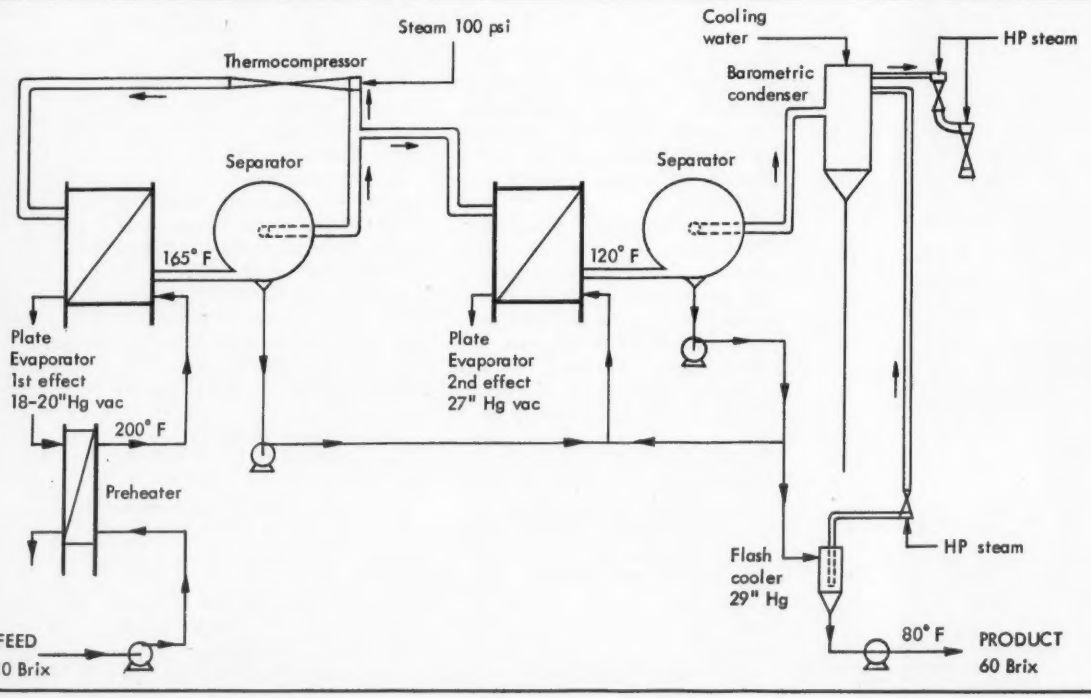
Feed to the first effect is automatically controlled so as to maintain a constant level in the discharge sump of the separator. Product discharge from the second effect is similarly regulated automatically. (All juice and concentrate pumps in the system are centrifugal except the one discharging product from the flash cooler, which is a positive delivery pump.)

Throughput is determined by rate of feed from the first effect to the second effect, which is manually adjusted by means of a graduated micrometer valve.

Also manually controlled is the steam pressure to the thermocompressor.

Operating conditions are re-

*Flexibility in capacity, however, is limited if recompression is part of the design, which is the case at Snively Groves, since a steam recompressor is only efficient over a relatively narrow operating range. The recompressor utilizes the energy of the supply steam at 100 psi to increase the temperature level of the heat available in the vapors from the first effect. In this way the heat in these vapors can be used to evaporate more juice in the first effect. The heat economy achieved is equivalent to that obtained by use of another effect. In the installation at Snively Groves, vapors from the first effect at 165 F and 19.0" Hg vac are compressed to 200 F and 6.5" Hg vac in a steam jet with 100 psi (gauge) steam.




**Schematic Flow Diagram**

Orange Juice Concentration in Plate Evaporator Installation at Snively Groves, Winterhaven, Florida

**Capacity**
13,000 lbs water evaporated per hour
1800 GPH feed
245 GPH product at 60 Brix

**Temp-Time Data**
Preheat feed to 200 F for 2½ to 3 sec to inactivate enzymes
Evaporate in 1st effect at 165 F
Evaporate in 2nd effect at 120 F
Contact time with heat exchange surfaces, about 10 sec
Throughput time with no recirculation in 2nd effect, 30 sec
Average throughput time with 30% recirculation in 2nd effect, 75 sec

corded on a central instrument panel, part of which is visible in the extreme right of cover photo.

Concentration of product from 2nd effect is determined by reading a built-in refractometer (a hydrometer can also be installed in line when desired). Concentration of product discharged from the flash cooler is about 2.4 Brix higher than the product from the 2nd effect.

Operator varies concentration of the product by adjusting the throughput rate with the micrometer valve previously described. Despite the relatively simplicity of the control system, he has no difficulty maintaining final concentration of the concentrate to plus or minus 0.1 Brix.

**Cleaning** is also relatively simple. System is rinsed with water and product discharge line is diverted to feed tank for recirculation of approximately 50 gallons of water. Then, half a bucket or so of strong caustic is added to form a 1 per cent solution, and recirculation continued for ten minutes. Vacuum is reduced so that the second effect operates at 160 F.

Total downtime need not be more than 20 minutes!

Whenever desired, the frame of the plate evaporator can be quickly opened so that all interior surfaces including the steam side of the plates are accessible for inspection.

Rapid start up is also a feature of the plate evaporator system. After reaching a steady state on water feed, a switch to juice is made and the product recirculated. A skilled operator will reach a steady state on juice feed after five minutes on juice feed, when the product discharge is sent to the blending tanks.

**Costs** are most favorable when comparing the plate evaporator system operated at temperatures described in this article with conventional tubular evaporators operated at temperatures below 90 F. In this case prime costs are much lower than conventional.

When comparisons are made for the same operating conditions, the prime and operating costs are more comparable, but still lower.

In any event, the installation cost of the plate evaporator is only about a fourth of the cost of the corresponding conventional evaporator.

It can be installed in a room having a ceiling height of only 9 feet as was the case at Snively Groves.

No special scaffolding or structural supporting framework is required. The complete unit, including feed tank will fit into an area of 500 square feet.

**New pilot unit** has been designed for experimental purposes. While intended primarily for university laboratories, it should prove useful for commercial development programs. Its capacity is 1000 lbs water evaporated per hour.

**Other applications** in commercial production are as follows according to Derek F. Dinnage, Chief Engineer of the A.P.V. Company:

| | |
|---|---|
| apple juice | up to 72% Brix |
| apple pectine | 7 |
| grape juice | 70 |
| pear juice | 72 |
| lemon juice | 50 |
| orange juice | 65 |
| ice cream mix | 27 |
| whey | 50 |
| buttermilk | 45 |
| whole milk | 50 |
| skim milk | 50 |
| sucrose | 68 |
| glucose | 75 |

The plate evaporator was introduced to commercial applications some two years ago in England. It was first announced in this country at the Dairy Exposition in December, 1958.

(The plate evaporator is a development of the A.P.V. Company. Offices in this country are at 137 Arthur Street, Buffalo 7, New York.)

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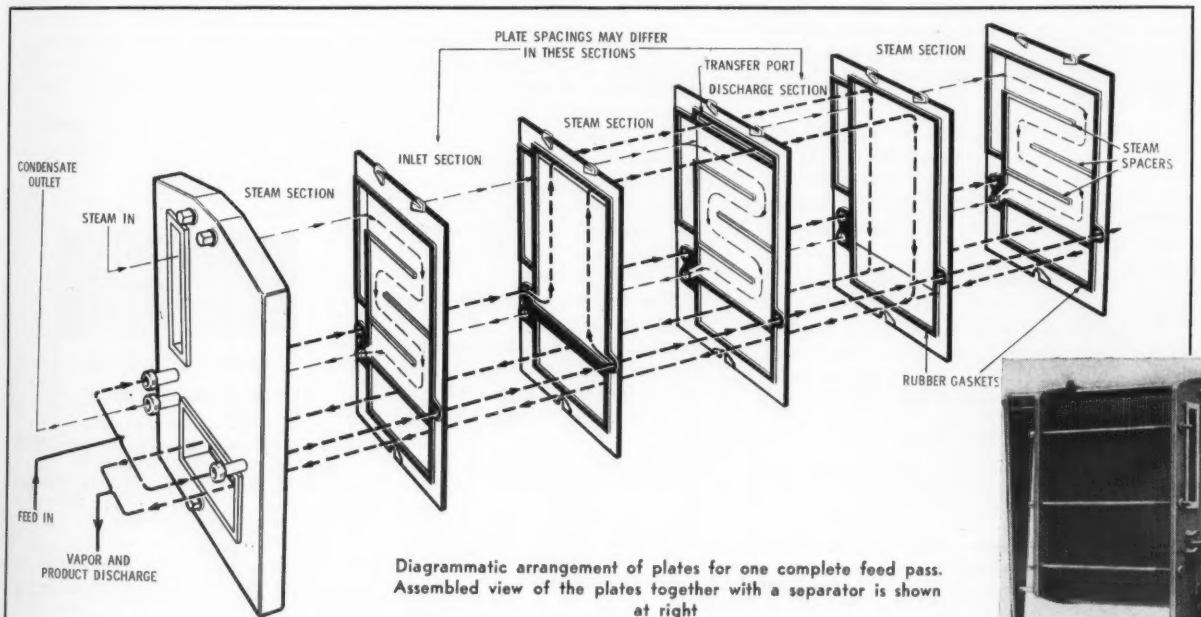
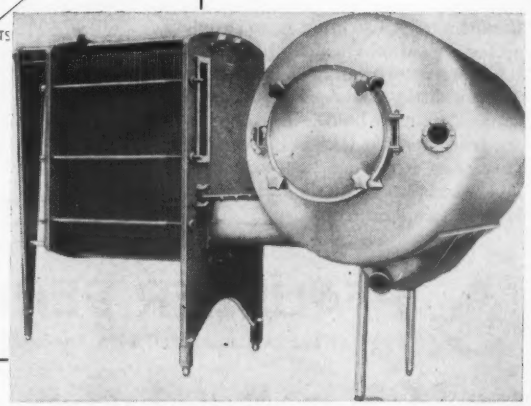
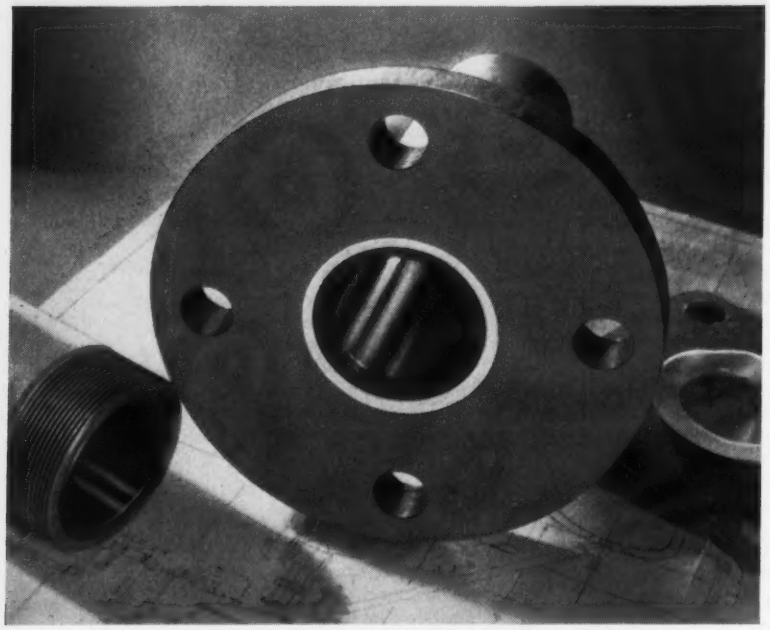



Diagrammatic arrangement of plates for one complete feed pass. Assembled view of the plates together with a separator is shown at right



# FLUIDICS* AT WORK



F-C Glasteel pipe that protects flavor is used with ASA 150# Series thread-on flange. Gasket features Teflon envelope at product-contact area.

## How to protect flavor when you pipe

Put any flavor you want through a section of Pfaudler F-C Glasteel pipe.* You'll get the exact same flavor out the other end.

The reason is simple: Unlike many other materials, Glasteel has no flavor. It takes nothing, adds nothing to what you pipe through it. Today. Or tomorrow.

With Glasteel (glass inside, steel outside) you protect the flavor, color and aroma of every product you handle. And you have the strength of steel to withstand "hard knocks" in the plant.

Even substances which might corrode other materials have no effect on Glasteel, because it is inert.

**Cleans easily.** Cleaning is no problem, either, because Glasteel has a hard, non-porous, extremely smooth surface. There's little chance for sticky substances to take hold. And, of course, you can sterilize Glasteel, since it has very good resistance to thermal shock and stands up to moderately high operating temperatures.

**Can be "field-cut."** You can fabricate this new pipe easily with tools found in most plant maintenance shops. For example, cutting can be done on most standard, dry abrasive cutoff wheels. This makes for simplicity in installation and modification. Likewise for maintenance.

**Choice of sizes.** Pipe has a glass lining ⅛ inch thick, is rated at 150 psi and comes in 1½, 2, and 3-inch diameters. You can get it now in limited quantities from stock in lengths through 10 feet.

**More information.** Details on operating characteristics and installation are covered in Bulletin 989. Ask for it or get answers to questions about availability and delivery by writing to our Pfaudler Division, Dept. FP-40, Rochester 3, N. Y.

*Patent applied for

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

**PFAUDLER PERMUTIT INC.**

Specialists in FLUIDICS ... the science of fluid processes

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### Reviews continuous fat and oil processes

Book presents new developments and modern trends; it outlines theoretical principles and follows with production techniques. General technology of fats and oils as well as statistical and economical aspects are presented.

Included in this 354-page text are solvent extraction and other production methods for vegetable and fish oils, refining operation and hydrogenation. There are also sections which cover the manufacture of margarine and miscellaneous processes.

Book is divided into eight chapters, each of which has its own reference and bibliography section. There are 30 illustrations and 40 flow diagrams.

("Continuous Processing of Fats," by M. K. Schwitzer, may be purchased for $9.00 from The Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N.Y.)

### How processing affects milk

Widely scattered data in the dairy field has been interpreted and integrated with basic principles of chemistry in this book.

Emphasis has been placed on basic composition, structure and properties of milk, and the chemistry of changes which occur in commercial processing of milk.

This textbook, designed for teaching principles of dairy chemistry to the undergraduate student, should be a useful reference book for the non-specialist in dairy chemistry.

Book has a total of 13 chapters. There is also an appendix in which are recommended dietary allowances and a summary of information on vitamins.

("Principles of Dairy Chemistry," 446 pages, may be purchased for $8.75 from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, New York.)


For FOODS with a

# Flavor Flair

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**KATER BRAND "Deep Smoked" Yeasts**
**VICO BF Flavors**

**KATER BRAND "Deep Smoked" Yeast** — either Brewer's Yeast or Torula Yeast — impart the natural aroma and flavor of true hickory smoke to foods giving them gourmet appeal. Their high smoke concentration, free from harsh or bitter after-tastes, permits balanced flavor at remarkable economy.

**KATER BRAND "Deep Smoked" Yeasts** combine high purity with flavor stability and nutrition values. As NATURAL FOOD PRODUCTS — not additives — they are acceptable under all regulations of the U.S. Food, Drug, and Cosmetics Act and are approved for certain applications in federally inspected meat plants.

**VICO BF Flavors** developed and compounded by specialists skilled in flavor processing for over 25 years provide tempting aroma and appetite stimulating meat-like flavor. Completely soluble in water, they are offered in dry or paste form.

Both **KATER BRAND "Deep Smoked" Yeasts** and **VICO BF Flavors** increase the sales potential of a great variety of foods and specialty products. Ease of handling, guaranteed uniformity, ready availability, stability and economy make both quality ingredients the choice of discriminating food manufacturers. Consult with us for personalized service and assistance in your food product development program.

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### Reference on dairy microbiology

"Dairy Microbiology" is a reference book prepared as an interpretive source of information for sanitarians, dairy fieldmen, laboratory technicians, students and others connected with the dairy industry. Important characteristics of organisms found in dairy products are cataloged, and their pertinence to dairy processing presented.

Factors influencing growth and death of microorganisms are discussed in detail. Sources of contamination are considered as well as the application of microbiology to specific dairy products.

First six chapters emphasize the application of well-known facts in science of microbiology to various pertinent phases of the dairy industry.

The main dairy organisms are described, first according to their classical taxonomic arrangement, and then according to the physiological groupings in which the various organisms produce the same changes in milk are placed together.

Also covered are factors affecting the growth of microorganisms with means of preventing growth where it is unwanted and of stimulating it where desired being particularly stressed.

Physical and chemical methods of killing microorganisms in milk and on dairy equipment are discussed in considerable detail. General directions for examining dairy products for microorganisms are given, with explanations of underlying principles.

Pictorial, graphic and tabular illustrations are provided throughout the book.

("Dairy Microbiology" is by Doctors Edwin M. Foster, University of Wisconsin; F. Eugene Nelson, Iowa State College; Marvin L. Speck, North Carolina State College; Raymond N. Doetsch, University of Maryland; and Joseph C. Olson, Jr., University of Minnesota. It is available for $11.65 from Prentice-Hall, Inc., Englewood Cliffs, N. J.)

New Penick & Ford Blender ensures production quantities at pilot plant tolerances

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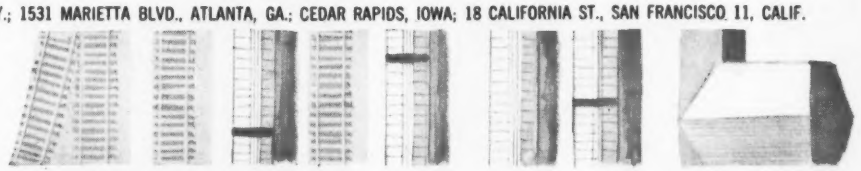

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# Complete automatic frankfurter production

## from finished meat emulsion to packaged five on fives, at Swift

- **cuts production time by 85 per cent**
- **improves uniformity**
- **increases shelf life**

### *SWIFT'S AUTOMATED FRANK LINE*

**Within the last two years developments for mechanizing sausage and luncheon-meat production, such as emulsifying mills, meat pumps, high-speed fillers, etc., have done much to streamline production and raise efficiency of the sausage segment of the meat industry. (See March FP, page 135).**

**These new developments have helped considerably in that portion of the production process which starts after the grinding operation and ends at the stuffing horn of the filler.**

**Except for improvement in materials handling and packaging, little significant progress has been made in unit operations following stuffing.**

**Swift's automated frank process starts with the emulsion in the stuffer and ends with finished franks.**

**With this process and other equipment now on the market, it is a matter of relatively simple engineering to completely automate frank production from the point of grinding boneless meat to cartoning and palletizing, ready for shipment.**

**By FRANK L. BONEM**
Associate Editor

SWIFT'S new frank replaces the unit operations of filling casings, feeding filled casings through linkers, hanging linked strands on sticks, placing sticks in cages and moving cages through smoking, cooking, washing and chilling cycles with an entirely new continuous process (see sketch).

Further, it eliminates moving cages into and out of coolers, removing sticks from cages and strands of sausage from sticks, peeling (for skinless franks) and feeding into packaging line for stacking, wrapping, etc.

Automated process performs all necessary operations, from forming to finished package, in total elapsed time of 1 hour and 15 minutes. It produces a frank that has found ready acceptance by the housewife after extensive consumer-testing.

Product, once it is in the stuffer, need not be contacted by hands again till the consumer opens the package. As a result, bacteria count of the franks is considerably lower and shelf life is generally increased.

Greater uniformity of product, both as to quality and weight, is achieved since all phases of continuous process are closely controlled and adjustments can be made to a finer degree than on a batch process. Any standard frank emulsion can be used.

Only three operators are required to service the process: an operator who refills the stuffers and checks the operation of the forming unit, an operator who checks the output of the unit for rejects and refills packaging machines with film and banding boards, and an operator who cases for wrapped packages and checks performance of overwrapping equipment.

Dual stuffers can be used to maintain a steady production rate of 1000 lb or 1000 one-lb packages per hour. Setup of stuffers is such that when one is empty, feed is automatically switched to second. Also, a signal light comes on to inform operator that a stuffer is ready for refilling.

#### Molding the franks

Key to the whole operation is use of an electric current to set the physical shape of the franks in the molds.

Molding or forming unit, see photo right, forms franks, in multiple, parallel molds made of Teflon.

After molds are filled and filling valves have closed, a high-frequency electric current passes through the emulsion which acts as a resistance in the circuit, thereby heating the emulsion and coagulating the protein. Passage of electric current through the emulsion is for a predetermined length of time to shape or set up the franks.

Electro-mechanical forming of franks appreciably decreases deviations from standard weight.

In compartments through which franks are carried on belt conveyor, smoking is by an essentially conventional smoke generator. Cooking is primarily by hot air, with steam serving as source of heat.

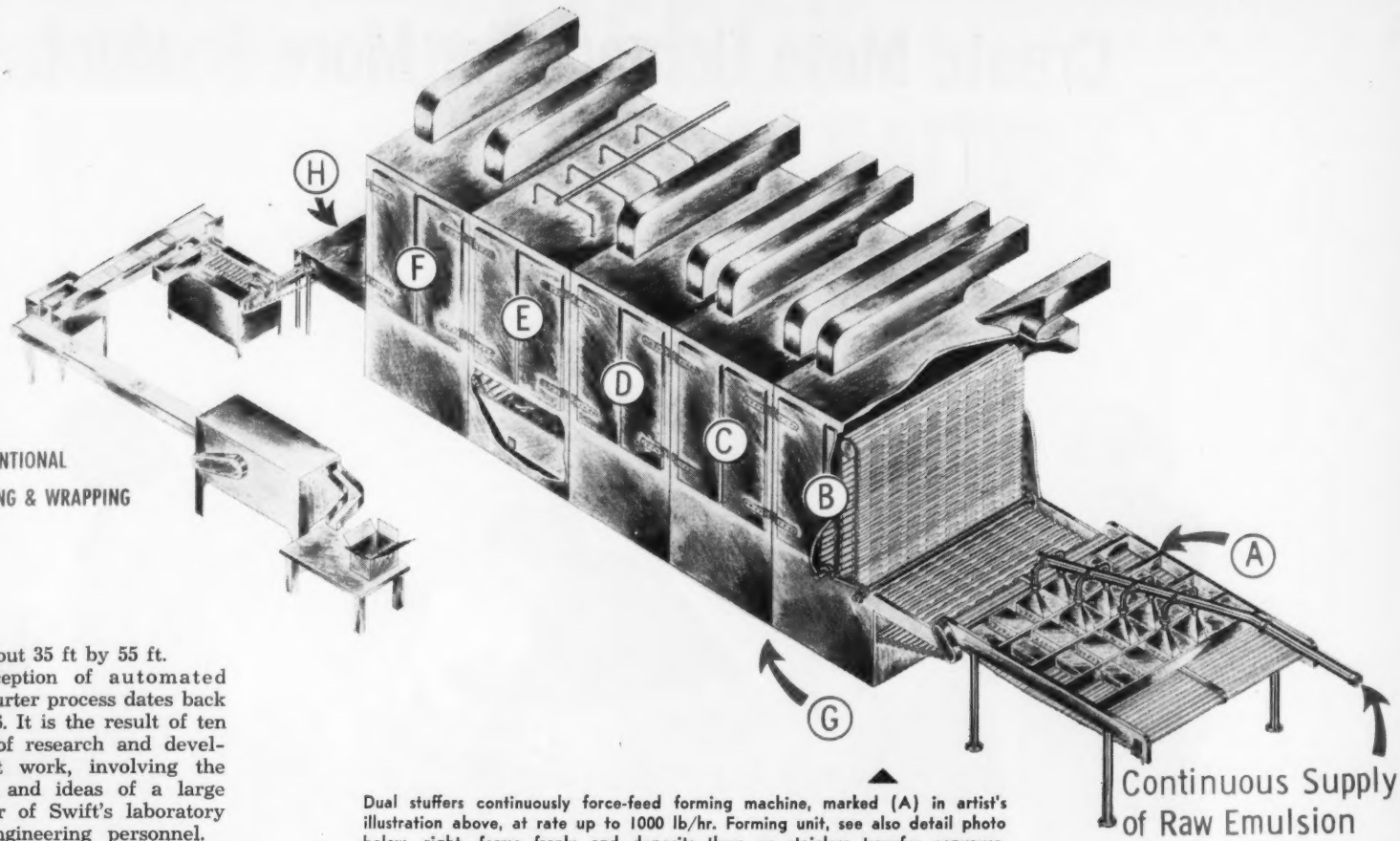
Color addition takes places in a spray chamber and is controlled by an automatic color density regulator.

Chilling is to an average temperature of 45 F by cold air and is accomplished in a matter of minutes. It eliminates the prolonged chill period and thus does much in cutting total time of process to 15 per cent of conventional method.

Low bacteria count is not only due to elimination of hand-handling but better sanitation throughout. All product handling parts are cleaned after every cycle; that is, conveyors, after discharging franks over end-pulley, pass through a sanitizing solution on return path.

At end of shift, entire unit is cleaned. Total clean-up time required is only 8 man-hours.

Floor space requirements for complete process, not including packaging operations,




Dual stuffers continuously force-feed forming machine, marked (A) in artist's illustration above, at rate up to 1000 lb/hr. Forming unit, see also detail photo below, right, forms franks and deposits them on stainless transfer conveyor.

Franks are deposited, eight at a time, from transfer conveyor to stainless steel perforated conveyor. This conveyor carries franks through integrally adjoining smoking chamber (B), cooking chambers (C) & (D), spray chamber (E) (where color is also added to franks when desired), and finally through chilling chamber (F). Side view of these chambers (G), is shown in photo below, center.

Franks are deposited by belt onto a packaging conveyor, see (H) above and detail photo below, left, for mechanically stacking, five on five, banding, wrapping and check weighing.

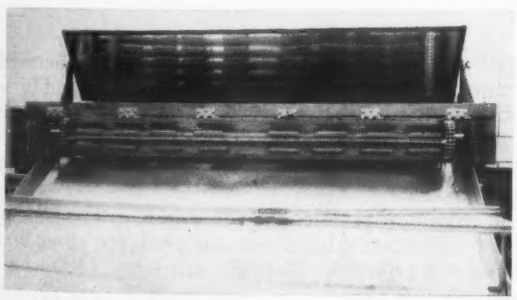
are about 35 ft by 55 ft.

Conception of automated frankfurter process dates back to 1946. It is the result of ten years of research and development work, involving the efforts and ideas of a large number of Swift's laboratory and engineering personnel.

Process first went into operation in Swift's South St. Joseph, Mo. plant in May 1956; a second operation was started up in the San Francisco, Calif. plant in August 1958.

Process is now being made available to everyone on a license basis.

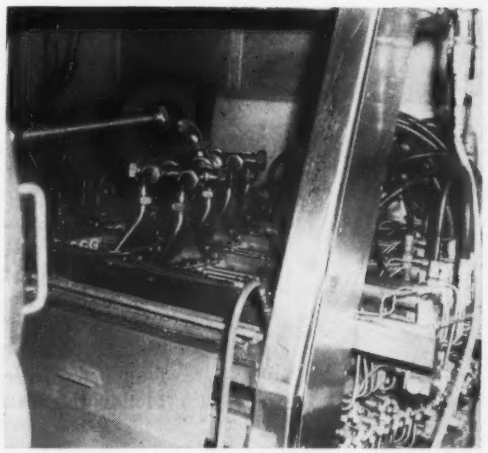
(For information on licensing arrangements, write Seelbach-Hill Corporation, 13 Montgomery St., Rhinebeck, N.Y.) 6918 on Reader Service Slip.



Completely processed franks emerge from chill cabinet, ready for packaging. Since chilling is part of continuous operation, need of cooler space for temperature "pull down" is eliminated.

Operating conditions in these processing chambers are automatically controlled and recorded on a main instrument panel

Forming machine molds and sets self-sustaining form of franks by "pre-cooking" with electric current



# Create More Demand for More Products by Mo

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Merck offers nearly a dozen different nutrients, all easily adaptable to normal food processing operations. Consider Merck Ascorbic Acid, for example. It can give you promotable vitamin C claims for any number of products—from gelatin desserts and instant potatoes to fruit juice blends and instant drinks. Merck lysine can improve protein quality of cereals, specialty breads and other processed foods containing vegetable proteins. Vitamins $B_{12}$ and $B_6$—both pioneered by Merck—are musts for all ages, are loaded with consumer appeal, give you unlimited opportunity for offering shoppers extra nutritional value in your products.

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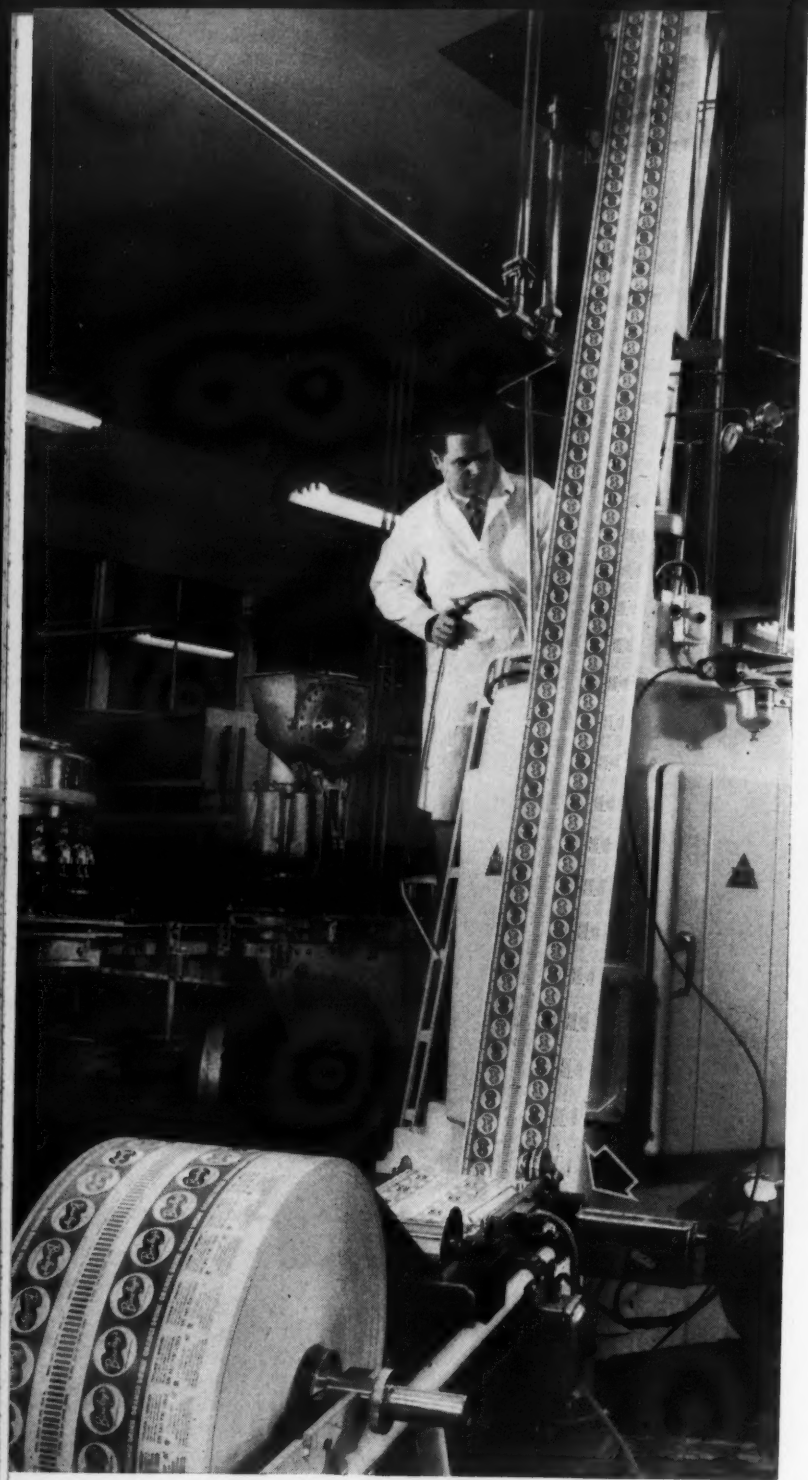
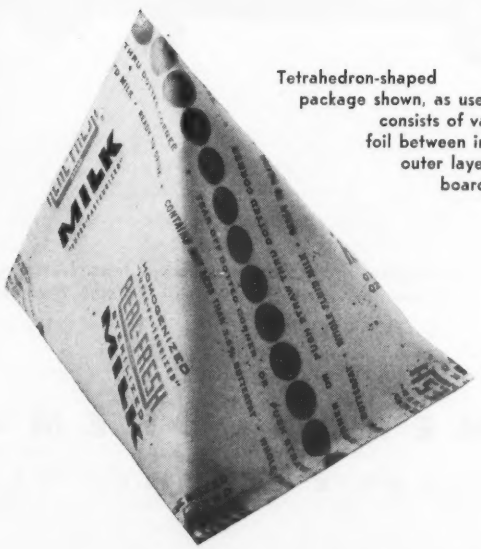
# Drastically lowers aseptic packaging costs

- Cost of paper-laminate Tetra Pak is one half of 8 oz metal cans
- The method: Chlorine asepsis of laminate, nitrogen filling; ultra-high short-time sterilization

**JOSEPH ZATKIN,** President
Associated Beverages, Inc., and
**ROBERT J. GRAVES,** President
Real Fresh Milk, Inc.
as reported by KARL ROBE, Associate Editor



After pre-sterilizing in chlorine spray chamber (arrow), web enters Tetra-Pak machine (top of photo). When roll is nearly depleted, it is unrolled and end is spliced to new standby roll with no interruption to production. (A view of other side showing forming and filling appears on page 122)




Tetrahedron-shaped package shown, as used by Real-Fresh and Bireley's, consists of vapor-barrier layer of aluminum foil between inner layer of polyethylene and outer layer of bleached white container board (inset photo). Outer surface is wax-coated after printing

A new preservation technique has been added to the food industry roster — aseptic packaging of liquids in paper laminate.

Two West Coast companies are now using it, with additional aseptic packaging machines being produced in Sweden.

Last month, Bireley's began aseptic packaging of orange and grape drink for institutional sales at their Oakland, Calif. franchise producer, Associated Beverage Co., after almost a year's contract production at the Real-Fresh Milk Co.'s plant in Visalia, Calif.

No benzoates or other preservatives are used in the product. Ascorbic acid is added for vitamin content.

**Real-Fresh Milk Co.,** Visalia, Calif. pioneered the sterile technique for export milk shipments and other liquids.

The aseptic method combines sterile techniques with Tetra Pak, a tetrahedron paper package that is formed and filled from roll stock, sealed and cartoned, all automatically.

Real-Fresh, together with Graves-Stambaugh Corp., Chicago, developed these sterile techniques: continuous chlorine spray, (followed by squeegee drying) of the polyethylene-faced foil-paper laminate; filling under a sterile nitrogen atmosphere in which air is displaced from package just prior to filling; and newest ultra-high (285 F), short-time (8 sec) flash sterilization for milk, followed by cooling to 72 F.)

Milk is homogenized, then passed through a vacuum deaerator to remove oxygen, thence through a Graves-Stambaugh heat exchanger.

In this heat exchanger, which was developed especially for heating milk to sterilizing temperatures, milk passes between two concentric cylinders in a helical path. The inner cylinder has a helical groove running around its periphery, which forms the passageway for the products being heated or cooled when the cylinders are assembled.

Both the inner and outer cylinder are hollow so that the heating or cooling medium in effect encircles the helical path. Milk is heated from 160 to 285 F in a path 100 ft long. It is held at 285 F for 8 seconds, then rapidly cooled in a unit similar in construction to the heater.

The two cylinders are tapered; the inner cylinder is mounted on a hydraulic jack so that it is readily separated from the outer cylinder, allowing full access to the heat-transfer surfaces for inspection and cleaning.

Equipment at Real-Fresh is sterilized prior to each run by 300 F water under pressure throughout entire system.

Kemp nitrogen generating machine furnishes sterile nitrogen.

Refrigerated distribution is not needed for the sterile product. Real-Fresh markets the aseptically packaged milk to the Armed Forces and Americans overseas.

**At Bireley's,** product is mixed in vats which have been sanitized with a chlorine solution such as used for cleaned-in-place piping in dairy industry.

All pipes and valves are pre-sterilized in this manner, then rinsed before production begins.

Product is sterilized in an APV plate heat exchanger at 238 F for 9 seconds. Heating medium is pressurized (15 psi back-pressure valve) hot water; a regenerative flow arrangement is used for heat economy.

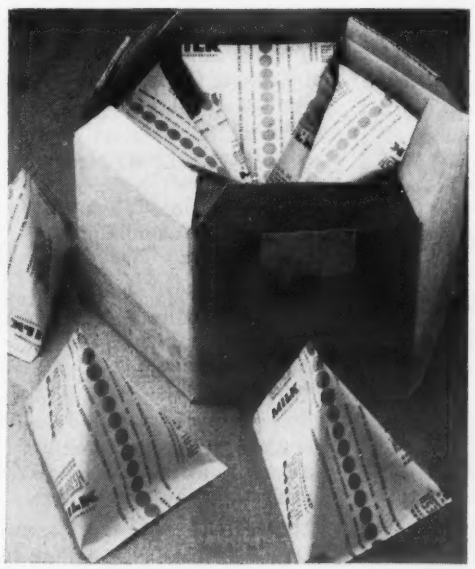
At the Tetra Pak machine, a continuous roll of printed four-ply laminate feeds into top of machine, is formed into tube and side-sealed. To avoid wicking of product into exposed edge on inside of package, a polyethylene strip is applied to one edge of laminate as it feeds from roll.

Inside of container is sterilized as it unrolls from stock. Laminate is threaded downward past a chamber where chlorine solution is sprayed against inner surface, then squeegeed by rollers as it passes upward into forming machine.

A plastic shield is usually draped around filling section to bar extraneous airborne particles, but is apparently not necessary for sterility. An ultraviolet lamp shines on interior surface of laminate just prior to forming.

As basic tube is formed (see diagram), a stainless steel pipe in center discharges sterilized nitrogen, purging the tube of air. As this happens, heated clamps seal tube crosswise to

(*Continued on page* 122)



Finished packages (left) are automatically placed in special hexagonal cases for palletized storage. Hexagonal corrugated one-way shipping carton (center) protects 18 packages against most shipping shocks, but some damage occurs in export. Palletized storage (right) shows strength and rigidity of Tetra Pak cartons, allowing full use of available warehouse space

Bireley's, aluminum ylene and container r surface printing

*at long last...an*

# IMITATION RASPBERRY

*with right-off-the bush flavor!*

GIVAUDAN'S NEW IMITATION RASPBERRY FLAVOR is an achievement long desired throughout the flavor-using industries.

Developed with painstaking care through many years of research, it duplicates with all of its fugitive and delicate nuances the rich flavor of the ripe raspberry as it comes fresh from the bush!

This new Givaudan development provides you with an opportunity to enhance—with true economy—the appeal of your raspberry-flavored products. Its high concentration and proved stability make it ideal for virtually every type of product in which raspberry is a popular flavor. We invite your inquiries.

Givaudan Flavors Inc.
321 West 44th Street
New York 36, N. Y.

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## conventions and exhibits

*Apr.* 19-21. Research and Development Associates, 14th annual meeting, Congress Hotel, Chicago.

*Apr.* 25-28. National Assn. of Refrigerated Warehouses, annual meeting, held in conjunction with Merchandise Division of American Warehousemen's Assn., Americana Hotel, Bal Harbour, Florida.

*Apr.* 26-30. Western Air-Conditioning Industries Assn., 3rd Western Air-Conditioning, Heating, Ventilating & Refrigeration Exhibit and Conference, Shrine Exposition Hall, Los Angeles, Calif.

*Apr.* 27-29. Pennsylvania Manufacturing Confectioner's Assn., 14th annual production conference, Marshall College and Hotel Brunswick, Lancaster, Pa.

*Apr.* 27-30. Western Air-Conditioning Industries Assn., 3rd Western air-conditioning, heating, ventilating and refrigeration exhibit and conference, Shrine Exposition Hall, Los Angeles, California.

*May* 1-5. American Assn. of Cereal Chemists, 45th annual meeting Morrison Hotel, Chicago.

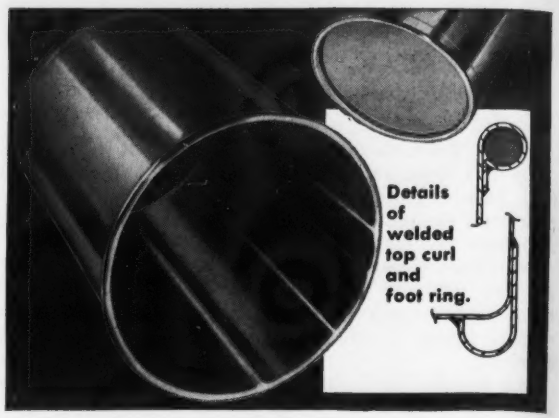
*May* 8-12. American Society of Brewing Chemists, annual meeting, Hotel Leamington, Minneapolis.

*May* 9-11. Biscuit & Cracker Manufacturers Assn. and Biscuit Bakers Institute, Inc., 57th joint annual meeting, The Plaza, New York, N.Y.

*May* 15-19. Institute of Food Technologists, 20th annual meeting, Fairmont Hotel and Masonic Temple, San Fransisco, Calif.

*May* 22-26. Assn. of Operative Millers, annual technical conference, Sheraton-Jefferson Hotel, St. Louis, Mo.

*June* 6-8. Material Handling Institute's New England Show, Commonwealth Armory, Boston.




**Pass any sanitarian's scrutiny!**

SEND FOR NEW BULLETIN 55

Hackney stainless steel food containers have a seamless cupped bottom section... crevice-free construction inside and out. Exceptionally strong, with open end curled over a steel reinforcing rod. Sturdy steel foot ring.

No container is easier to clean and keep clean. Sizes: 30 and 55 gallons. Covers available.

Hackney MILWAUKEE

**Pressed Steel Tank Company**
*Manufacturer of Hackney Products*
1459 South 66th Street, Milwaukee 14, Wisconsin
Branch offices in principal cities

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

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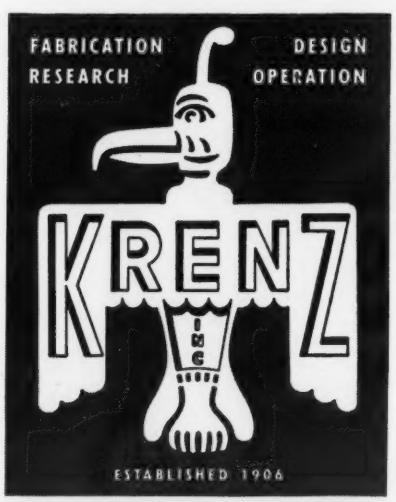
**ESSENCE PLANTS**




**OSCAR KRENZ INCORPORATED**

ASHBY AT SIXTH STREET
BERKELEY 10, CALIFORNIA
Telephone THornwall 5-1400

**PROCESSING EQUIPMENT that PAYS OFF in PERFORMANCE!**

- Evaporators
- Vacuum Pans
- Flash Break Units
- Mixing Tanks
- Condensers
- Heaters
- Rotary Coil Vessels
- Kettles
- Essence Recovery Systems

Write for complete details

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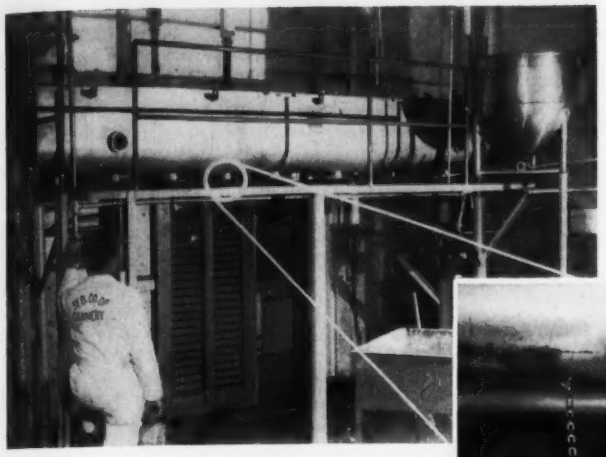

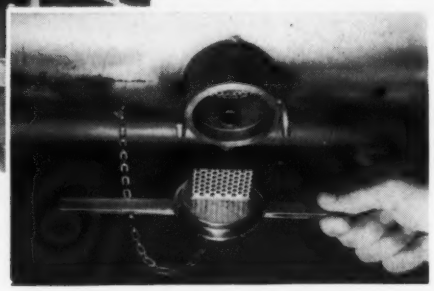

Compact blancher is located high to conserve floor area. Low-velocity steam, on entering diffuser, strikes perforated baffle plate set at right angles to steam inlet pipe, then bubbles up into blancher through perforated diffuser top

# Eliminate over- or under-blanching

**Screw action pushes apples through at controlled rate—'floaters' can't override**

**PROBLEM:** At Sebastopol Cooperative Cannery No. 2, Sebastopol, Calif., water blanching of apple slices for canning was accomplished by conveying them on stainless steel belts through a tank of hot (195 F) water.

This standard method had been satisfactory, but Sebastopol Co-op desired more than just standard. One objection was that the big wooden tank took up too much floor space and required too much maintenance.

In addition, some apple slices could float to top of tank and overblanch before they sank and were discharged by belt.

**Solution:** Apple slices are now blanched in a screw-type heat exchanger, mounted overhead. Steam is introduced through ports at 18 in. intervals along bottom of covered trough, see photo above.

Blancher is compact, having a 16 in. diameter screw and 15 ft trough length. Speed of screw can be changed as needed to vary length of blanch.

Inlet steam is throttled automatically to control water temperature. Direct exposure of product to incoming steam is eliminated by jetting steam through diffuser welded to bottom of trough.

**Results:** Over-blanching is prevented by positive forward conveying action of screw. Also, water level is maintained below top of screw so that slices cannot float over screw and remain in blancher too long.

Automatic temperature control of water and positive speed control on screw allow precise blanching time, so that both under- and over-blanching are prevented.

Blancher has required no downtime during production in two years of operation.

(Rietz Thermoscrew heat exchanger used for blanching is a product of Rietz Manufacturing Co., 150 Todd Road, Santa Rosa, California.)

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# BUFLOVAK DRUM DRYERS

*for cereals, syrup, vegetables, starch, yeast, baby foods, extracts, waste*

Whatever your material in process may be, Buflovak Equipment will provide the way to the most profitable operation. ■ Vacuum or atmospheric, single or double drum, Buflovak can job-tailor the dryer for your product. ■ For details, write for Catalog 384, Buflovak Equipment Division, 1559 Fillmore Ave., Buffalo 11, New York.

*Buflovak Equipment Division*

**BLAW-KNOX**

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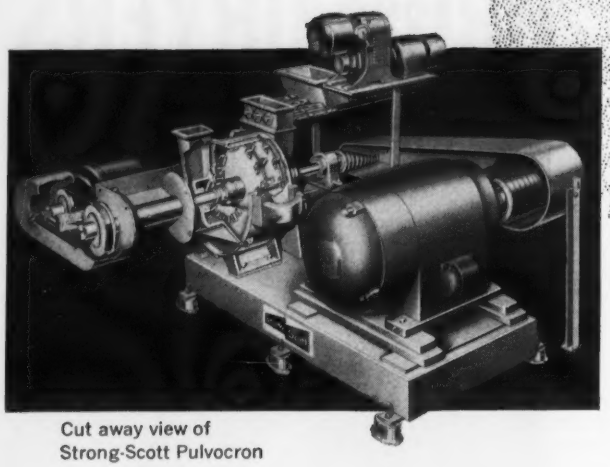

Cut away view of
Strong-Scott Pulvocron

Magnified Sample of
SITOSTEROLS
Pulverized to
minus 10 microns

# Pulverizing with Selective Particle Size Control!

### INCREASE PRODUCTION AND CUT OPERATING COSTS WITH THE NEW PULVOCRON

Because this unit is so versatile, it can pulverize hard or soft materials and can operate in the extreme fineness range (95 to 99% finer than 5 to 10 microns) or it can operate in the coarse particle size range (50 mesh and thereabouts).

The Pulvocron is now being used to solve many size reduction problems in the chemical, food and related process industries. Available in 20 and 38-inch grinding chambers and constructed of carbon or stainless steel.

### SPECIAL FEATURES

- **Pulverized product particle size control**
- **Pulverized product temperature control**
- **Installation versatility**
- **Accessibility for inspection**
- **Sturdy construction for years of service**

**THE PULVOCRON IS AN ADVANCED IMPACT AND AIR ATTRITION PULVERIZER COMBINED WITH INTERNAL PARTICLE SIZE CLASSIFIER.**

### TYPICAL INSTALLATIONS USING 20" PULVOCRON

| | |
|---|---|
| Product | Soya Sitosterols |
| Feed Material | 40 Mesh (Approx.) |
| Pulverized | 99.99% minus 10 microns |
| Capacity | 500 lbs. per hr. |

| | |
|---|---|
| Product | Urea Formaldehyde |
| Feed Material | ¼ to ⅜" Diameter |
| Pulverized | 99% minus 80 Mesh |
| Capacity | 1600 lbs. per hr. |

*Consult Strong-Scott with your pulverizing problems*

The Strong Scott Mfg. Co.

451 Taft Street N. E., Minneapolis 13, Minnesota • Phone: STerling 1-7461

EQUIPMENT DESIGNED FOR BETTER PROCESSING

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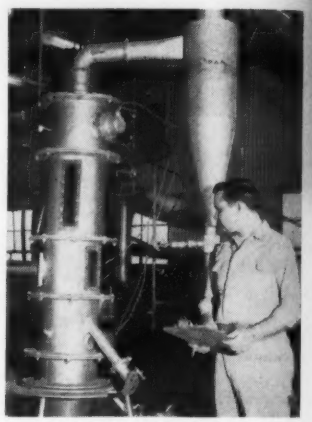
*processing*

## Fluidized bed drying, profitable for you?

**Advantages can be tested in pilot plant facility**

Use of pilot-size dryer is offered to industry for test and development work in drying or cooling powders or granular materials such as starches, flours, flour enzymes, cocoa milk or cultivated mushrooms.

It can be used to determine first, if a specific material can be processed by the fluidized-bed method; and second, to obtain data necessary for production-size units.



Fluidized bed on SS laboratory model is vertical section with windows. It can be varied from a depth of 6 in. to 3-4 ft. Instruments, whose lines may be seen between dryer and collector, measure temperatures at six points and air velocities at three points

Drying of materials by fluidizing is accomplished in pilot-size model, as in production models, by suspending solids in fast moving air stream. As particles dry, they become lighter and are blown out of dryer.

One advantage of this method is that small particles which require short drying period are carried out of dryer quickly; larger particles, which need longer drying period, are retained in bed section longer.

Therefore, co-incidental to drying or cooling, particle-size separation can be effected.

Temperature across fluidized

bed is uniform and there is a direct relationship between bed and final product temperature. Very close regulation of temperature with comparative ease is possible which readily lends this method of drying to automation.

In laboratory model, air velocity ranges from 0.5 fps to 2 fps and volume from 24 cuft/min up to 90 cuft/min. Particle size can vary from 200-350 mesh up to ⅛-3/16 in. in cross section.

(For information on testing products in pilot-size dryer, write General American Transportation Corporation, Louisville Dryer Division, 135 S. LaSalle St., Chicago 3, Ill.)

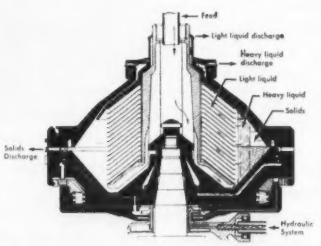
### Centrifugals for liquids with high solids ratio

**Ejects solids while spinning at full speed**

**Uses:** For recovery of protein from whey or from animal fat; for clarification of coffee, beef broth or molasses; purification of tallow or lard and for processing fruit juices, sugar juices, cocoa fat and baby foods.

**Features:** Water, fed through series of slots on underside of bowl, builds up hydraulic pressure which keeps bowl in closed position.

To discharge solids, feed is shut off and water drained.




**Hydraulic pressure of 120,000 psi keeps sliding discharge ports closed. Release of pressure opens ports for solids discharge**

Weight of solids forces sliding bowl bottom downwards, thus exposing a series of slots on periphery of bowl.

With bowl still running at


SARCO

**Here are 7 Sound Reasons Why the Thermo-Dynamic® Does a Better Job of Trapping**

1. *Simplicity*—has only one moving part. 2. *Maintenance*—practically zero. 3. *Wide pressure range*—one trap for all pressures from 10 to 600 psi. 4. *Uniform performance*—operates equally well on heavy, light, or no condensate load. 5. *Operates against back pressures*—up to 50% of inlet pressure. 6. *Rugged*—unaffected by superheat, water hammer, vibration, or corrosive condensate. 7. *Minimizes inventory* of spare parts.

**Maintenance Time: 40 Seconds.** If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This Sarco Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

**For Prompt Information on the TD-50 . . .** or for fast help on the efficient solution of any steam trapping problems, get in touch with a SARCO District Office, Sales Representative, or Distributor. (There's one near you.)

Only SARCO makes all 5 types:
Thermo-Dynamic* • Thermostatic • Liquid Expansion • Float Thermostatic • Inverted Bucket

*U.S. Pat. No. 2,817,353 TM Reg. U.S. Pat. Off. 1409

SARCO COMPANY, INC.
635 Madison Ave., New York 22, N. Y.

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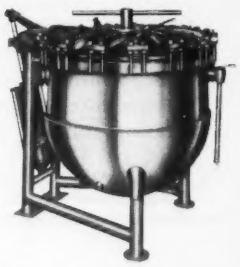
quality foods insure repeat sales

every batch is uniform

DO IT BETTER WITH **GROEN**

**STEAM JACKETED KETTLES**

When you're dealing with taste, the flavor and quality of your product is of paramount importance. Groen steam jacketed kettles assure the finest cooking results through the most efficient method of heat transfer ever developed. They provide the correct cooking temperatures faster plus a thorough mixing action that gives consistent uniformity to cooked foods. These easy-to-clean stainless steel kettles save time, labor and fuel, cutting production costs to a minimum. Write for complete information and begin now to build bigger profits.



Complete line of tanks, coils, vacuum kettles, revolving pans, tubular heat exchangers, pilot plant units and special equipment to specifications.

**GROEN MFG. CO.** 1900 Pratt Blvd., Elk Grove Village, Ill.
30 Church Street, New York 7, N.Y.

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ENGINEERING PERSPECTIVE
THROUGH A

# VENTURI

*Venturi tubes were first used for measuring fluid flow. While this application has increased substantially, the use of the Venturi in important unit process operations has increased even more. A Jet-Venturi combination is literally the heart of many important manufacturing processes.*

**JET REFRIGERATION**
**JET COMPRESSORS**
**JET CONDENSERS**
**JET HEATERS**
**JET PUMPS**
**JET MIXERS**
**JET REACTORS**
**JET ABSORBERS**
**JET FUME SCRUBBERS**
**SPECIAL JET VENTURI UNITS**

During the first several years of the forty-two year history of our firm, we specialized entirely on steam jet vacuum pumps (ejectors). Many thousands of these are in service throughout the country and in most foreign countries. Our tradename, EVACTOR, is an important word in engineering circles. While steam jet vacuum pumps are still our major item, other applications of Jet-Venturi equipment are increasing constantly. With the exception of closely related products such as barometric condensers, CHILL-VACTORS, and CONVACTOR* systems, all of our activity is directed to the one purpose of making Jet-Venturi units more efficient, more dependable, more economical, and to apply them to an increasing number of industrial applications.

* The CONVACTOR is a dual condensing system for economic and efficient recovery of high boiling components from water vapor.

CROLL REYNOLDS

**Croll-Reynolds CO., INC.**

Main Office: 751 Central Avenue, Westfield, N. J.
New York Office: 17 John Street, N. Y. 38, N. Y.

CHILL-VACTORS® • Steam-Jet EVACTORS® • Aqua-VACTORS® • Fume Scrubbers • Special Jet Apparatus

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full speed, centrifugal force causes solids to discharge through slots. Complete discharge cycle takes very little time and eliminates manual bowl cleaning.

**Description:** Three models make up line of separators with capacities as follows: 200—1500 gph; 400—3000 gph; 1000—6000 gph. Maximum specific gravity for machines is 1.5; however, special bowl designs are available for materials of higher specific gravity.

Standard construction of separators is corrosion-resistant bowl, cast aluminum cover, cast-iron sludge cover and manual operating controls.

Machines can be equipped with stainless steel bowl, bowl cover and sludge cover, automatic operating controls and other optional equipment.

(Model PX centrifugal separators are produced by The De Laval Separator Company, Poughkeepsie, N.Y.)
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## Ball milling— to critical standards

Line of 6 batch mills range from 1 pt to 55 gal capacity; 4 sizes for continuous mill

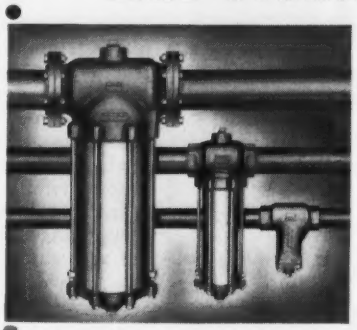
**Uses:** For pulverizing, micronizing or mixing to fine standards. Vibrating ball mills are adaptable to wide range of dry or wet, raw or in-process materials.

**Features-Description:** Handling materials regardless of abrasiveness, hardness, or compactness, plus higher output at reduced milling time are advantages claimed for machine.

Mill, by intense, high-velocity vibration, which forcibly agitates milling medium in grinding chamber, reduces materials by crushing, shearing, grinding and attrition. Drive is by rotating eccentric mechanism which uses coupling to transmit vibration.

Continuous system incorporates a dual-chamber mill that first processes material through a coarse chamber. Rods or large balls are utilized as

**LINE STRAINERS**

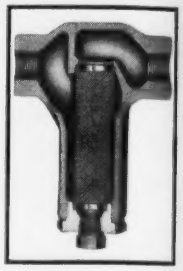


for **SPRAY NOZZLE** SYSTEMS and RELATED APPLICATIONS

in stainless steel, cast iron and brass

A complete range of capacities in ¼" to 4" female pipe connection sizes . . . and in 3" to 6" flange connection sizes. Keeps lines clear for efficient operation. Easily flushed.

**TOP PERFORMANCE DESIGN**
Screen area so large that strainers will take 75% blocking with less than ½ lb. pressure drop under normal flow conditions. Top and bottom flange collars on screen give seal fit and rigidity.



**SPRAYING SYSTEMS CO.**
3213 Randolph Street
Bellwood, Illinois

WRITE FOR your free copy of BULLETIN 94 ...gives complete information

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*Companies with a critical eye on the cost of pumping corrosives use*

# AMPCO® CENTRIFUGAL PUMPS

Stainless steel, Ampco Metal, Illium "G", elastomer- and rubber-lined pumps — *available from stock.* Engineered to resist velocity, corrosion, and erosion. Special-pump features at standard-pump prices.

Let your Ampco Field Engineer help *you* cut pumping costs. Write us for his name. p-40

AMPCO METAL, INC. Dept. 229D Milwaukee 46, Wisconsin
West Coast Plant: Burbank, Calif. • Southwest Plant: Garland (Dallas County), Texas

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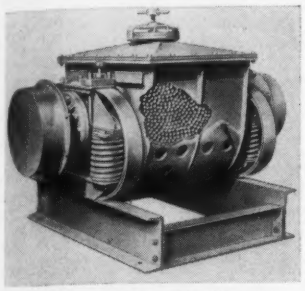
milling medium.

When reduced to proper size, coarse-ground product passes automatically through control grid or screen into fine grinding chamber for further reduction.

Secondary chamber is also equipped with control grid



Eccentric vibration forcibly agitates balls causing them to ricochet off wall of chamber, thus grind against one another in constant rotary motion

through which finer-ground product automatically passes when milled to proper size.

Oversize fraction or tailings produced by external separators can be automatically returned.

Milling media and chamber liners on machines are readily changed to adapt mill to particular process requirements.

(Vibratom mills are distributed by Schutz-O'Neill Co., 307 Portland Ave., Minneapolis 15, Minn.)

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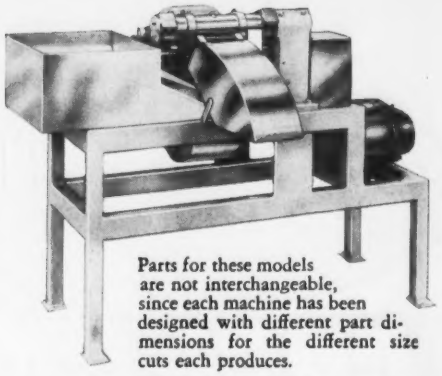
"Come see us again, . . . in 10 years . . ."


**URSCHEL**

*Models* **F, G, H** *and* **GK** *...*

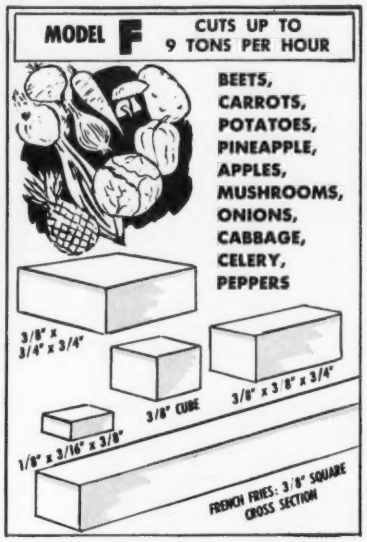
*are* **4** *Separate Cutting Units!*

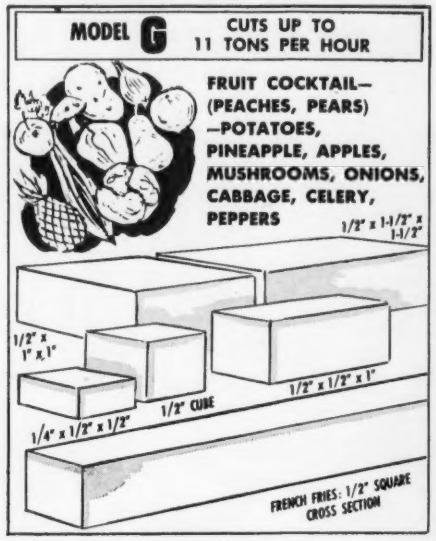
*They all look alike...all operate alike*

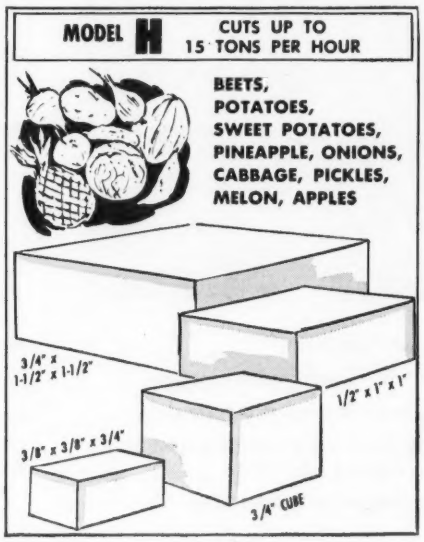


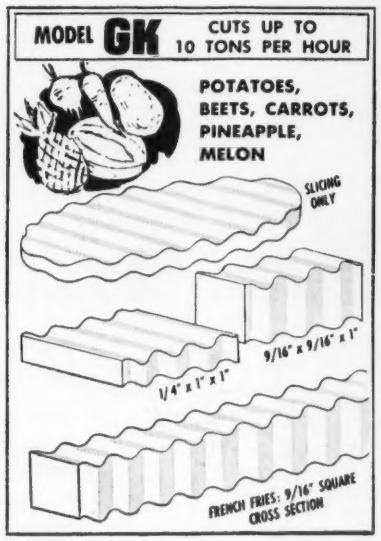
Parts for these models are not interchangeable, since each machine has been designed with different part dimensions for the different size cuts each produces.

**...but each produces a different range of cut sizes!**


MODEL F
CUTS UP TO 9 TONS PER HOUR
BEETS, CARROTS, POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
3/8" x 3/4" x 3/4"
3/8" CUBE
3/8" x 3/8" x 3/4"
1/8" x 3/16" x 3/8"
FRENCH FRIES: 3/8" SQUARE CROSS SECTION


MODEL G
CUTS UP TO 11 TONS PER HOUR
FRUIT COCKTAIL—(PEACHES, PEARS)—POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
1/2" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
1/2" CUBE
1/2" x 1/2" x 1"
1/4" x 1/2" x 1/2"
FRENCH FRIES: 1/2" SQUARE CROSS SECTION


MODEL H
CUTS UP TO 15 TONS PER HOUR
BEETS, POTATOES, SWEET POTATOES, PINEAPPLE, ONIONS, CABBAGE, PICKLES, MELON, APPLES
3/4" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
3/8" x 3/8" x 3/4"
3/4" CUBE


MODEL GK
CUTS UP TO 10 TONS PER HOUR
POTATOES, BEETS, CARROTS, PINEAPPLE, MELON
SLICING ONLY
9/16" x 9/16" x 1"
1/4" x 1" x 1"
FRENCH FRIES: 9/16" SQUARE CROSS SECTION

The product to be diced is fed first to the inside of a slicing shell, where it is then rotated by an impeller at high speed. Centrifugal force causes product to slide around the inside surface of slicing shell. As product approaches top of this shell it slides over an adjustable slicing gate which controls slice thickness. Slicing knife is at top of slicing shell. At the instant of slice, cross cut knives ride down, cutting slice crosswise into strips, or french fry cuts. These knives throw the product into the revolving circular knives that cut the strips into cubes.

This new cutting principle has many advantages over previous methods. When slicing any product with a knife, the product tends to crack parallel with the knife's edge, particularly in brittle, root vegetables. Product cracking is overcome by **cutting parallel with the strains set up**, thus eliminating strains and the resultant cracking.

Product damage is eliminated by moving the product in a straight line from the time the first cut is made until the last cut is made, which reduces impact and crushing, and makes possible the high operating speed and quality of cut produced.

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

**URSCHEL LABORATORIES INC.**
VALPARAISO, INDIANA

*Designers and manufacturers of precision, high speed cutting equipment for food products*

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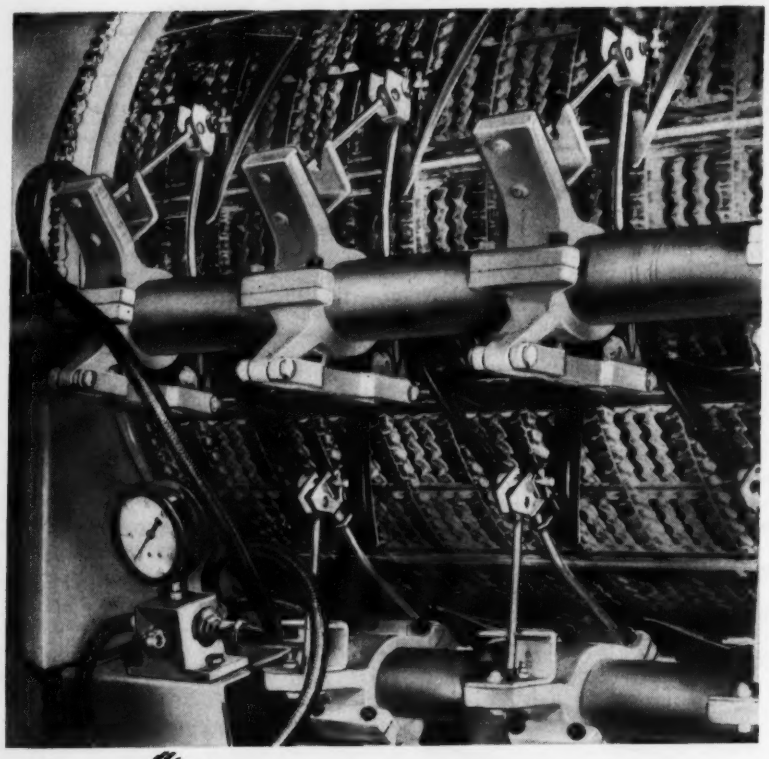
REDUCE SNIPPER CYLINDER AND KNIFE WEAR WITH THE OSCILLATING KNIFE ASSEMBLY
*and the New*

**CRCO*** AUTOMATIC PNEUMATIC
"SAY "SEE-AR-CO"
*KNIFE RESET*



- **Exact pressure required**
- **Each knife with exactly same pressure**
- **Hook it up to airline or use bicycle pump**
- **Rides easily out and by foreign object in pocket to automatically reset**
- **Oscillation distributes wear and avoids grooving**

***Write for complete information***

THE BEST OF Everything

**CHISHOLM-RYDER CO. INC.**
*Niagara Falls, New York*
FOR THE FOOD PROCESSOR

6941 on Reader Service Slip.

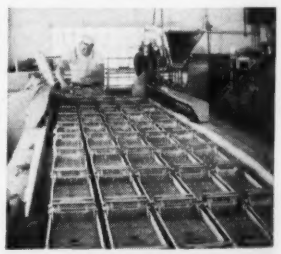
**SILICONE NEWS from Dow Corning**

# Prevent Costly Foam

## Dow Corning Silicone Defoamers Reduce Waste, Increase Capacity

Foam is costly . . . it takes up production space, slows down processing, causes maintenance problems—may even create a fire hazard! You can control foam once and for all with the most effective antifoams ever developed: Dow Corning silicone defoamers.

Odorless, tasteless, and physiologically harmless, Dow Corning silicone defoamers are used extensively in processing and packaging foods, syrups, and antibiotics. Effective at extremely low concentrations and safe to use, they neither alter nor contaminate the end product. Dow Corning Antifoam A may be used in nonstandard foods at concentrations to 10 ppm; water-dilutable Antifoam AF Emulsion may be used at concentrations to 34 ppm.



IN FREEZING MIXES

A typical application: in making Fudgsicles, foaming of milk, chocolate and other ingredients caused numerous rejects of frozen bars and also cut production space. Antifoam AF Emulsion added to the processing prevents foam . . . helps keep production up and costs down.

IN ANTIBIOTICS

Write for a FREE SAMPLE giving an indication of your foaming problem and whether it's in an aqueous or oil system. Address Dept. 5704.

first in silicones

**Dow Corning CORPORATION**
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

6942 on Reader Service Slip.

Two of five machines utilized in yeast production. Total output of all machines is 25,000 lb/24 hours. Ice flakers are readily accessible for inspection and cleaning

# Ice flakers replace block ice in yeast production

- **Improve quality**
- **Increase sanitation**

**PROBLEM:** Ice, needed to absorb heat generated chemically and mechanically in mixing operation of yeast production, was purchased in blocks for St. Louis plant of Anheuser-Bush, Inc.

Delivered to loading dock, blocks of ice were loaded into carts and transported to third floor storage area. When needed, blocks had to be thoroughly washed and then crushed prior to being taken to mixing machines.

Irregularly sized particles of ice resulted in excess moisture which in turn caused blemishes on finished product.

**Solution:** Five mechanical ice-flake machines, so arranged that flakes can be fed directly into yeast mixing and tempering equipment, circumvent cumbersome handling of ice blocks.

Purity of ice is maintained by rigid control of water supply to machines.

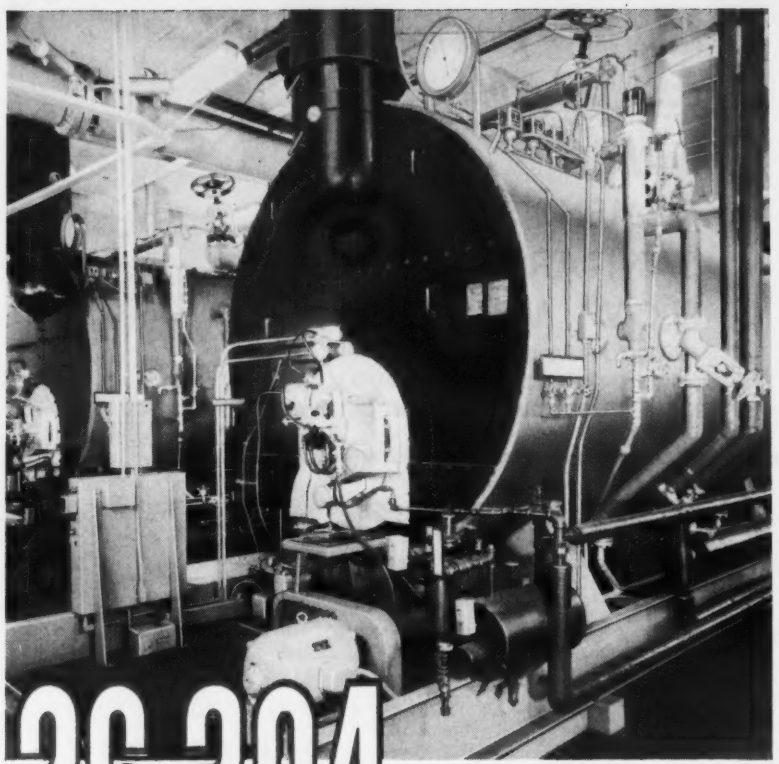
**Results:** Since ice flakes are uniform in size, weight of moisture introduced into yeast during production can be controlled and blemishes are eliminated.

Short, direct path from flakers to mixers and opportunity to control water that is used in ice making have greatly increased sanitation and almost entirely eliminated chances of contamination.

Besides these improvements, it was found that installation also reduces cost of ice.

(Instant-Ice Machines are products of Liquid Freeze Corporation, 1133 Twenty-fourth St., Oakland, Calif.)

6943 on Reader Service Slip.



**26,304 hours of dependable process steam**

**Except during annual 2-week vacations, these Cleaver-Brooks packaged boilers have operated continuously for 3 years**

At C. F. Mueller Co., Jersey City, largest American producer of macaroni and egg noodles, even a brief unscheduled boiler shutdown would ruin $15,000 worth of drying products. To insure against this possibility, two 400-hp Cleaver-Brooks Model LR-600-40 high-pressure boilers were installed for low-pressure operation.

These packaged boilers, which also supply steam for the firm's plant-heating system, operate 24 hours a day, 7 days a week for 50 weeks a year. C. F. Mueller Co. officials report very little maintenance is required.

This is one of hundreds of installations in which Cleaver-Brooks packaged boilers are saving money on initial installation, upkeep, long-term investment, and day-in and day-out dependability.

Cleaver-Brooks manufactures 130 packaged boilers, 15 to 600 hp, gas, oil or gas/oil fired. For details on any application, call your representative or write Cleaver-Brooks Company, Dept. D, 357 E. Keefe Ave., Milwaukee 12, Wis.

**Cleaver Brooks®**

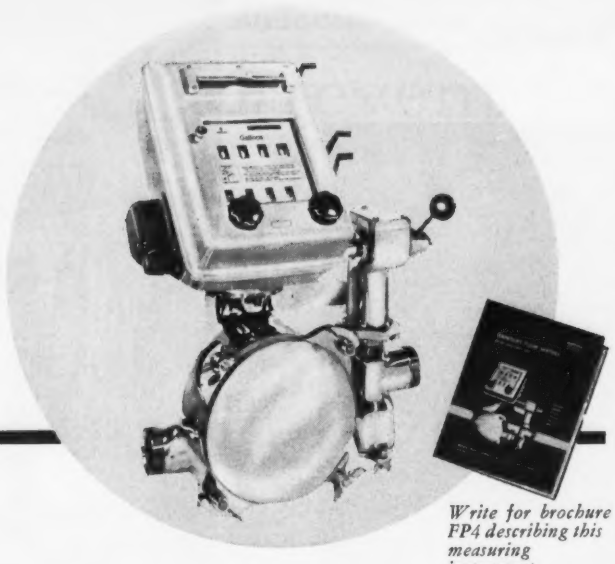
ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

6944 on Reader Service Slip.

## *Improve your process cost controls with*

# SIEMENS SANITARY FLOW METERS

**PROVIDES PERMANENT PRINTED RECORDS OF ALL LIQUID FLOW, AT INTAKE AND ANY POINT ON YOUR PRODUCTION LINE.**



Gives accurate check of liquid flow in loading and unloading of tank trucks, automatic blending, assures accurate accounting through elimination of unaccountable losses.

*Write for brochure FP4 describing this measuring instrument.*

FOR JUICES • BEVERAGES • SOUPS • BABY FOODS • EGG PRODUCTS • DAIRY PRODUCTS • AND OTHER LIQUID FOODS

**SIEMENS**

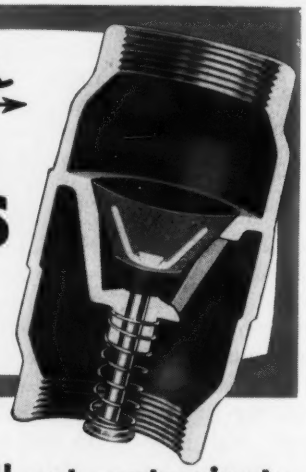
Sold and Serviced in USA and Canada through: T.E.A., INC., 141-21, 72nd Ave., Flushing 67, New York

6945 on Reader Service Slip.

*Strataflo*

# CHECK VALVES

**for semi-solid and liquid food handling equipment**



## New valve resists acids, will not contaminate

The new No. 3300 Strataflo Check Valve is designed to eliminate many of the problems encountered in semi-solid and liquid food handling equipment. Acid cannot harm the rugged one-piece body which is cast of a high nickel alloy. A large port area and unique straight line flow give greater capacity with low restriction. There are no "pockets" to fill up and encourage contamination. Easily cleaned by back-flushing. Leak-proof Neoprene poppet is non-toxic, odorless and tasteless. Valve will operate in any position; 200 lbs. working pressure. Available in three sizes: ¾", 1" and 1¼". Write for Bulletin 208 for information and prices.

**STRATAFLO PRODUCTS, INC.**
FORT WAYNE, INDIANA

6946 on Reader Service Slip.

ELECTRONICS-TIME *Lumenite* AUTOMATIC CONTROLS

- *ELECTRONIC LIQUID LEVEL*
- *INDUSTRIAL TIMERS*
- *TIME SWITCHES*
- *MAGNETIC SWITCHES*
- *ELECTRONIC SWITCHES*

**Your business is of first importance, therefore, all LUMENITE manufacturing and engineering are devoted to the sole production of Controls. In the following list of Bulletins there is a Control best suited to your operation in a money making and saving way.**

**For complete information and prices check ☑ the Bulletins you want. We'll send them without obligation. Tear out the ad and use it for your requests.**

**The Bulletins are technically informative; with load capacities, installation diagrams, etc.**

- ☐ TIME SWITCHES
- ☐ PROGRAM CLOCKS
- ☐ CYCLE REPEATERS
- ☐ TIME DELAY RELAY
- ☐ AUTO-LAWN SPRINKLERS
- ☐ LIQUID LEVEL
- ☐ MILK LEVEL
- ☐ NONCONDUCTIVE LIQUID
- ☐ AUTOMATIC RESET
- ☐ ICE THICKNESS
- ☐ BOILER LEVEL
- ☐ MOTORIZED SANITARY VALVES
- ☐ INTERVAL TIMERS
- ☐ PHOTO-ELECTRONIC RELAYS-COUNTERS, ETC.

**All LUMENITE products have a responsible guarantee**

**LUMENITE ELECTRONIC CO.**
*ENGINEERS • DESIGNERS • MANUFACTURERS*
407 South Dearborn Street Chicago 5, Illinois

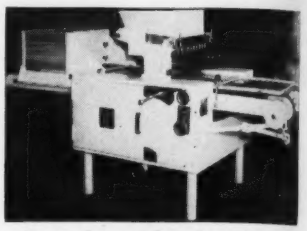
6947 on Reader Service Slip.


*processing*

### Versatile, automatic confectionary depositor

**Uses:** For depositing cream, gum, jelly, fondant, marshmallow, chocolate, licorice etc.

**Features:** Machine automatically fills starch impressions, grooved rubber mats or glossy plaques placed in 18 in. by 18 in. trays. It can also fill foil or paper cups which are accurately located within tray by perforated inserts.



**Drop of tray after deposit controls tailing of stringy materials and to some extent height of deposit**

Machine will deposit mixtures containing fruit or nut pieces up to ⅛ in.

**Description:** Weights and volumes are accurately controlled by hand lever which locks at any point on volume scale and acts on special pump bar.

Overall speed is varied by hand-wheel adjustment. Two other hand-wheels control tray height and drop of tray after deposit.

(N.I.D. Universal Depositor is distributed by Cantab Industries, PO 54, Station Q, Toronto 7, Ontario, Canada.)
6948 on Reader Service Slip.

### Creams fruits, vegetables as well as meats

Two-stage emulsifier minces 350 to 700 lb per min

**Uses-Features:** Commutation mill not only can be used to produce liverwurst, bologna and franks; it can also be used in creaming spinach, making apple sauce and cider, and any type of baby food or puree.

Mill makes fine emulsion since product passes through two sets of knife-and-plate

assemblies in which knives rotate at 3600 rpm. Knife-and-plate assemblies are located in two cutting chambers which are designed to force

Temperature rise of product, as it passes through two-stage emulsifier, is only 10 to 12 degrees

emulsions through plates by centrifugal force.

**Description:** Knives are in fixed position at all times. Clearance between plates and knives is set by lowering or raising plates.

Emulsifier has 10 in. diameter plates which have holes ranging from 1/20 to ¾ in. in diam.

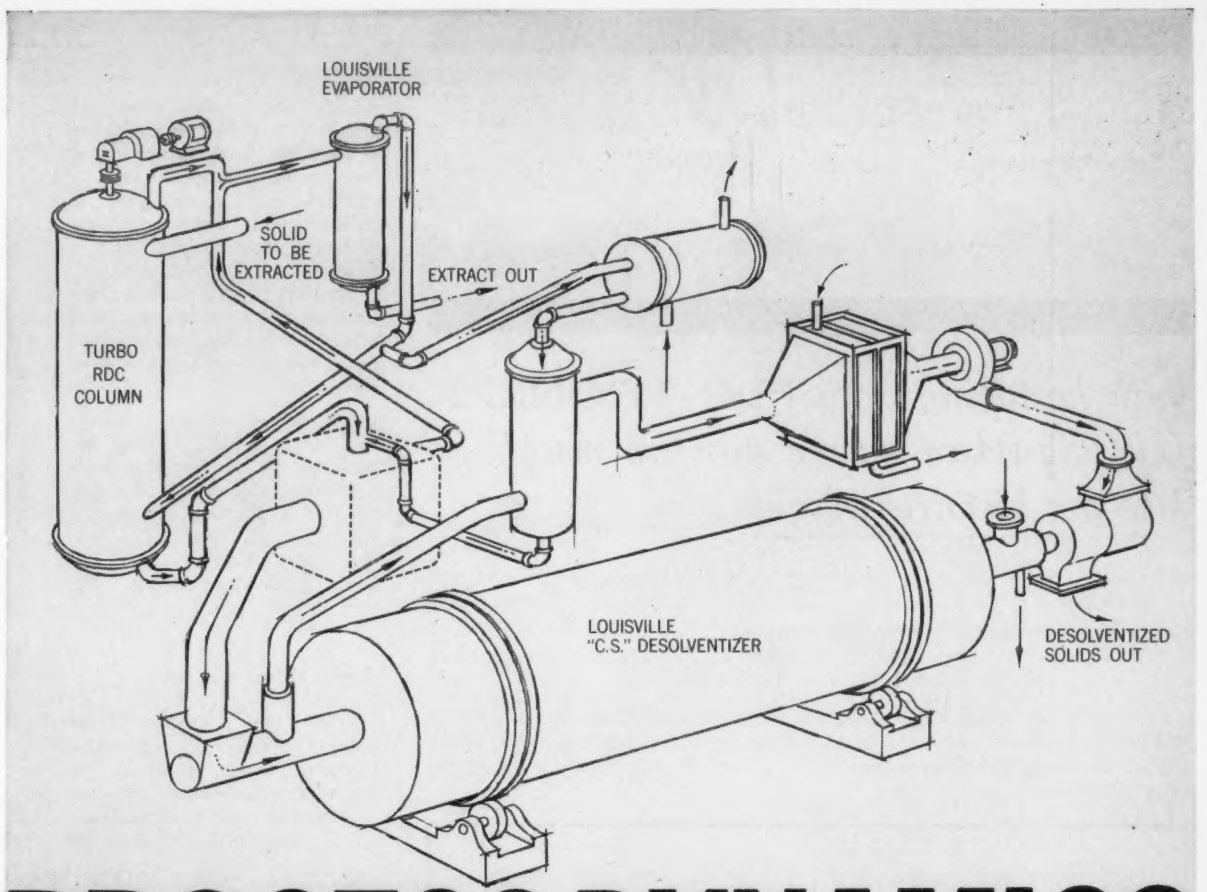
All parts of machine that contact product are made of SS or acid-proof aluminum.

(Further information on Swiss Robot Emulsifier may be obtained from Robert Reiser & Co., Inc., Food Equipment Division, 253 Summer St., Boston 10, Mass.)
6949 on Reader Service Slip.

### Summarizes $CO_2$ uses in meat packing

Carbon dioxide ($CO_2$) is used extensively throughout the meat industry in all of its three states—solid, liquid and gas. Applications are presented in 12-page brochure which is divided according to shipping, packing and processing.

Processing section covers use of $CO_2$ gas for humane


# PROCESS·DYNAMICS

## A new concept for evaluation and control of **Equipment** and **Process Performance**

General American's wide diversification permits the design of equipment for *controlled performance* and *process in transport*. This diversification plus specialized experience and extensive laboratory facilities assures you of correct equipment construction and maximum utilization of automated systems.

Our engineers, with their broad experience in equipment and process specialties, are ready to work with yours to provide any of the listed equipment and systems, and to install them anywhere in the world.

Unified responsibility as provided by General American means greater efficiency, fewer complaints, improved coordination and far less down-time than you can possibly get when your equipment is furnished by a variety of suppliers.

Process Equipment Division
**GENERAL AMERICAN TRANSPORTATION CORPORATION**
*135 South LaSalle Street*
*Chicago 3, Illinois*
*Offices in principal cities*

LOUISVILLE PROCESS EQUIPMENT—TURBO-MIXER—TRAYLOR ENGINEERING—FULLER COMPANY—DRACCO DIVISION—SUTORBILT—KANIGEN CHEMICAL PLATING—PLATE & WELDING—WIGGINS CONSERVATION STRUCTURES—FIELD ERECTION DIVISION—blowers • compressors • conservation systems • conveying systems • coolers • crushers • cryogenic equipment • crystallizers • dewatering presses • dryers • dust control equipment • evaporators • extraction equipment • fans • fractionating columns • gas absorbers • gasholders • mixers • preheaters • pressure vessels • pumps (gas and vacuum) • rock product processing equipment • storage tanks (floating, fixed and lifter roofs)

6950 on Reader Service Slip.

slaughtering; also use of crushed or pulverized dry ice in chilling lard and making sausage or luncheon meats.

Blast chilling, as well as chilling with dry-ice blocks, of trailers and railway cars is explained and illustrated.

Similarly, methods for packing meat, trimmings and offal with dry ice for shipment in barrels or cartons are presented.

("$CO_2$ serves the meat industry," form ADPC 43, may be obtained by writing the Pure Carbonic Company, division of Air Reduction Company, Inc., 150 E. 42nd St., New York 17, N.Y.)
6952 on Reader Service Slip.

### 5-gal drum warmer

**Uses:** For warming 5-gal drums containing such high-viscosity food products as shortening, sirup or chocolate.

**Features:** Drum warmer can be used with either of two

Drum warmer can be plugged into any 110-120 V outlet

thermostatically controlled temperature ranges: 60-250 F and 200-550 F. Hot spots are avoided by baffled radiation.

**Description:** Warmer has wire-reinforced, flexible asbestos gasket for snug fit. It has 2-in. sheet of fibreglass insulation and aluminum reflector. Warmer weighs 22 lb.

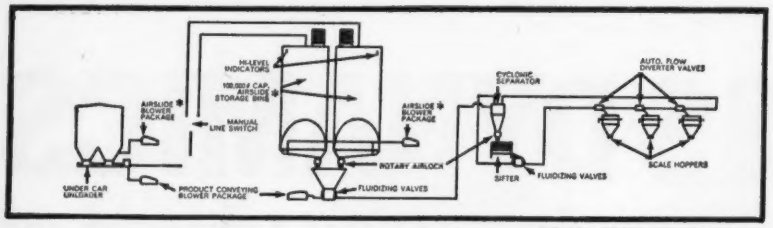
(5-gal drum warmer is a product of the Harold L. Palmer Company, 28625 Grand River Ave., Farmington, Michigan.)
6953 on Reader Service Slip.


SUGAR. . . . STARCHES. . . . FOOD MIXES. . . . STARCHES. . . . INS
OFFEE. . . . STARCHES. . . . INSTANT COFFEE. . . . FOOD MIXES. . . . FLOU
FLOUR. . . . FOOD MIXES. . . . INSTANT COFFEE. . . . SUGA INSTANT COFFEE.

*bulk handling with* FLO-TRONICS®
*fluidization saves you as much as 42¢ per hundredweight*

Since their introduction, more and more firms using powdered or granular materials are realizing the tremendous savings ($3.50 to $6.00 per ton) possible with Flo-tronics air conveying systems. These systems not only eliminate the cost of individual containers; they vastly reduce the high cost of hand labor, free precious space and working capital, and provide complete sanitation.

Flo-tronics Fluidization Systems are custom engineered. Costs vary according to a firm's capacity requirements and facilities. Typical savings realized by a baking firm handling bulk flour are illustrated in the following table. (See diagram for installation.)




* T.M.—Fuller Company

| | |
|---|---|
| *The following is a cost study for a typical complete fluidizing system as shown above including plant layout, custom engineering, mechanical installation, automatic controls, and electrical installation* | *$37,000.00* |
| *Down payment* | *7,000.00* |
| | *$30,000.00* |
| *36 Month carrying charge* | *$ 4,500.00* |
| *Total Finance* | *$34,500.00* |
| *Average monthly payment* | *$ 958.00* |
| *Product usage* | *1000 CWT/per week* |
| *Bulk Savings* | *$0.42 per CWT* |
| *Total savings per month* | *$ 1,820.00* |
| *Total savings 36 months* | *$65,520.00* |
| *Cost of system per month* | *$ 958.00* |
| *Cash Saving with system per month* | *$ 1,820.00* |
| *Net Saving per month* | *$ 862.00* |

**WILL A FLO-TRONICS FLUIDIZATION SYSTEM SAVE MONEY FOR YOU?**

Whether or not such a system would be a profitable capital expenditure depends on such factors as capacity requirements, plant layout, and of course, reduction of costs. A general rule is that a system should pay for itself in 36 months or less. If you wish, Flo-tronics engineers will be glad to make an engineering evaluation of your material handling requirements. For an engineering estimate, write or call Mr. William P. Edmunds, Dept. 204

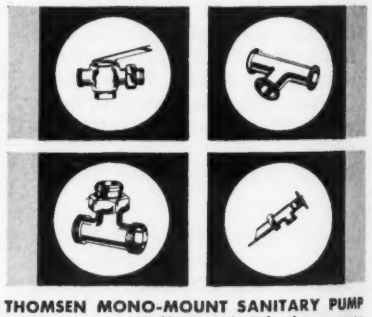
FLO-TRONICS INC
1420 zarthan avenue
minneapolis 16, minn

6951 on Reader Service Slip.

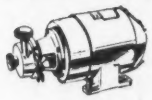
Take down and assemble in seconds with...

PROVEN CLAMP CONNECTIONS

Looking for a set-up on which to standardize? The answer is Thomsen stainless steel lines and fittings. Key to maximum efficiency for clamp-in-place or take-down lines is the new Thomsen vise action clamp which has more exclusive features than any clamp on the market. Go Thomsen all the way with pumps, tubing, fittings and valves. They will provide valuable engineering counsel on request.



THOMSEN MONO-MOUNT SANITARY PUMP



Here at last is the common sense sanitary pump design. The new Mono-Mount makes assembly and disassembly fast and easy. Stainless steel —no rust, no corrosion, easy cleaning.

*FREE—New Thomsen clamp and fittings catalogs—write Department F*

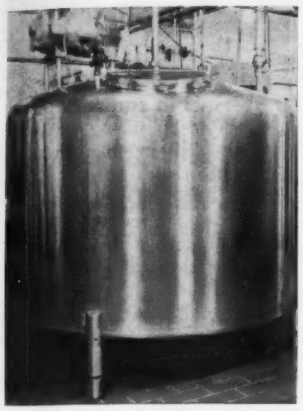
L. C. THOMSEN & SONS, INC.
KENOSHA, WIS.

6954 on Reader Service Slip.

### 350 to 1100 gal sanitary tank

**Uses:** For all types of fluid food products, tank can be used for intermediate holding or blending, also as balance or surge tank.

**Features:** Tank is equipped with fitting for spray cleaning.



Stainless tank has four adjustable ball-foot legs and 18 in. ID manhole

Bottom of tank is convex and pitched to outlet nipple for rapid and complete draining.

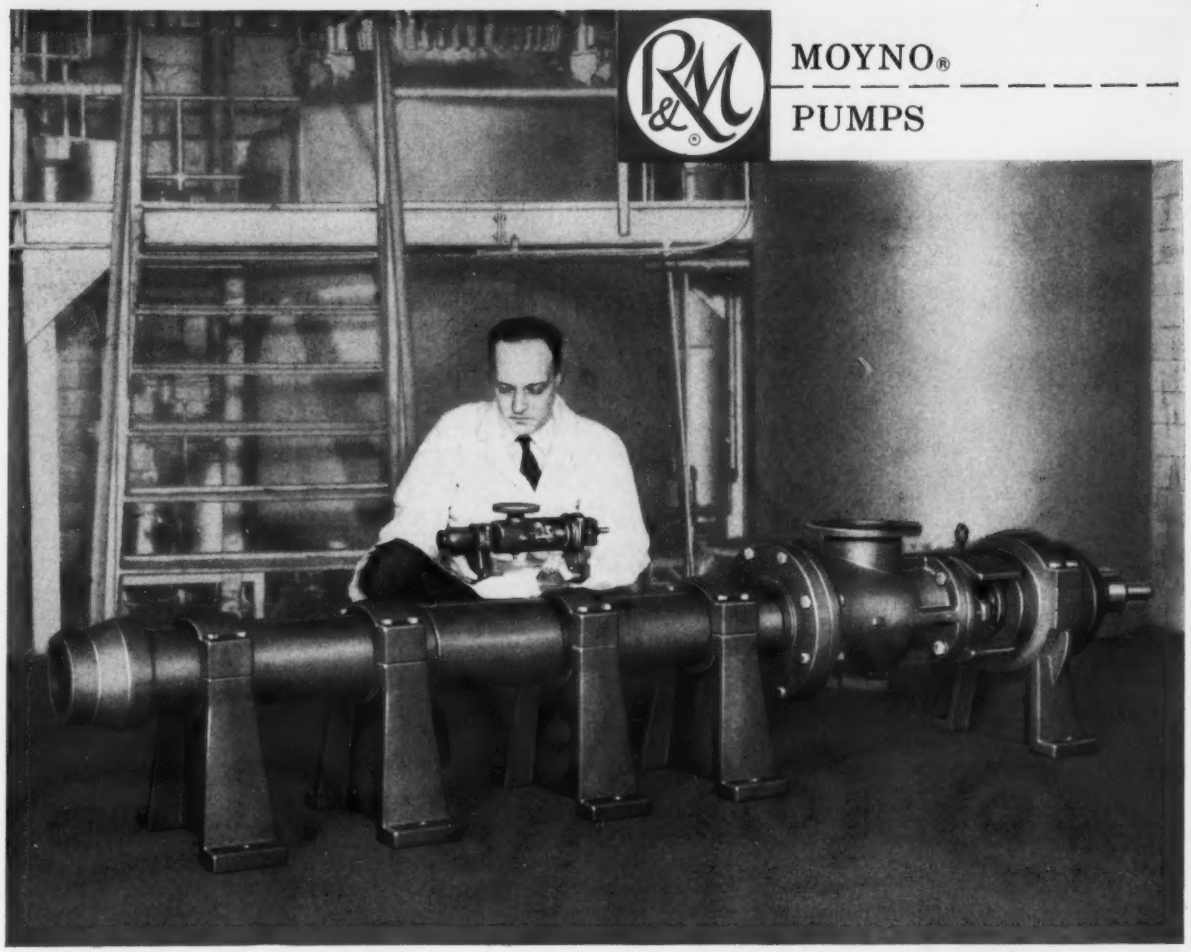
**Description:** Stainless steel, single-shell tank is of welded construction with integral dome top. Agitator, which is mounted off center, has two-speed drive and is easily removable.

(Line of tanks is made by The Creamery Package Mfg. Company, 1243 W. Washington Blvd., Chicago 7, Ill.)
6955 on Reader Service Slip.

### No air entrainment in centrifuging

Air entrainment in milk centrifuging operations causes foaming which can cause high butterfat losses, high mechanical losses and present other obstacles to smooth dairy processing.

Full discussion of foaming problem and how it can be eliminated in air-tight centrifuges is presented in 12-page booklet. Seals, by which air is kept out of the machines, are taken up in detail, and inlet

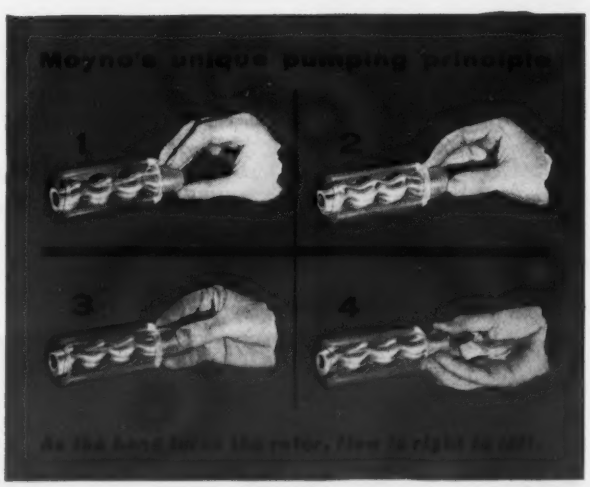




**MOYNO® PUMPS** ***capacities: from 1/100 to 500 gpm pressures: up to 1000 psi***

MOYNO pumps are available in nine sizes with capacities ranging from minimum metering flow to 500 gpm and pressures from zero to 1000 psi. Positive displacement delivers uniform discharge without pulsation, agitation or turbulence. Solutions ranging from thin watery slurry to extremely viscous paste, corrosives, abrasives and even solids in suspension are economically handled without excessive pump wear.

MOYNO's unique *"progressing cavity"* principle with only one moving part and special resistant internal parts slashes pump maintenance costs on problem materials that often ruin other pumps. Almost any substance that can be forced through a pipe can be pumped by a MOYNO.

To learn how a MOYNO can cut your pumping costs, write today for Bulletin 30-FP




**ROBBINS & MYERS, INC.**
*motors, household fans, Propellair industrial fans, hoists, Moyno industrial pumps*
SPRINGFIELD, OHIO · BRANTFORD, ONTARIO

6956 on Reader Service Slip.

and outlet parts are illustrated.

Various models of centrifugals are illustrated and their capacities tabulated.

("Why Buy An 'Air-Tight'?" is available from The De Laval Separator Company, Poughkeepsie, N.Y.)
6958 on Reader Service Slip.

### Grind wet, dry or oily materials in sanitary mill

Mill will grind, granulate, pulverize or blend wide variety of food items, as for example spices, teas, nuts, fruits, peanut butter, pumpkin, horseradish or cracker meal.

Material is ground in air by 16 blades rotating at speeds from 350 to 7200 rpm. Product-contact areas are made of stainless steel.

For temperature control, hopper feed, screw and pump feed inlets and outlets may be obtained with hollow walls so that fluid can be circulated.

Full description of mill, as well as features and specifications, are presented in four-page brochure.

(Brochure on "Cogmill" is available from The Cog Corporation, division of Motiograph, Inc., 4441 W. Lake St, Chicago 24, Ill.)
6959 on Reader Service Slip.

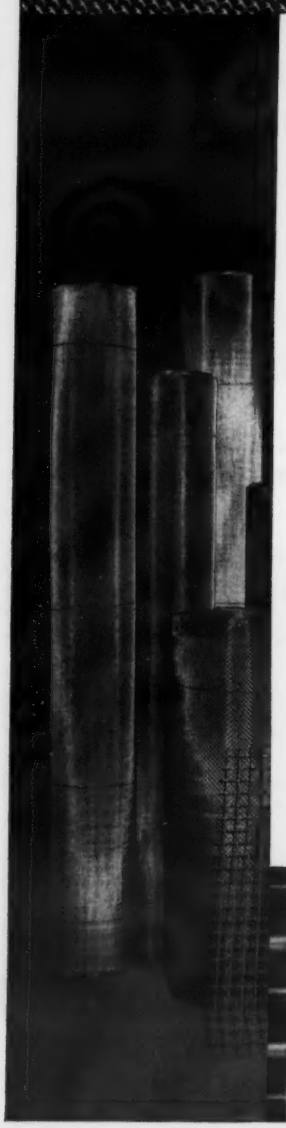
### Refrigeration compressors, from 13 to 225 tons

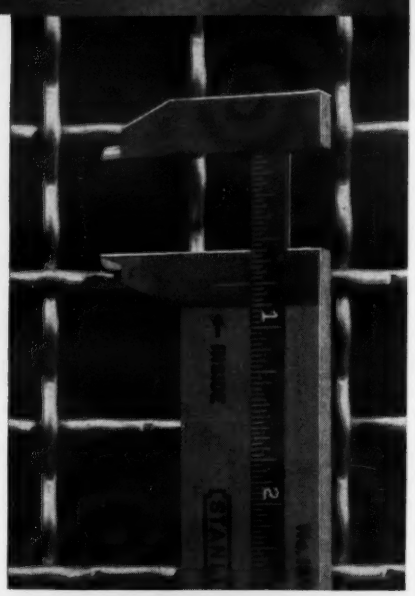
From small, 2-cylinder, high-speed machines to large, 4-cylinder, slow-speed machines, 36-page bulletin reviews refrigeration compressors for ammonia or freon gases. Various models and their applications are discussed and illustrated.

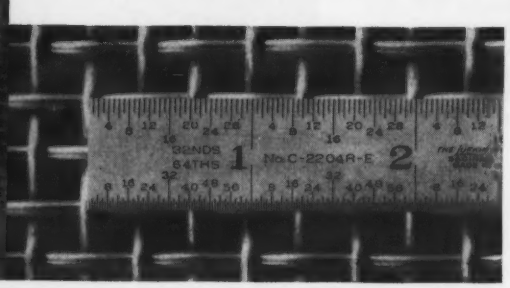
Brochure first presents a brief discussion on principles of refrigeration. It then deals with low-pressure refrigeration units from ¼ through 20 hp for two pages.

Other refrigeration equipment and systems discussed

(*Continued on page 60*)







**Who counts 'em?**

*CAMBRIDGE does . . .*

. . . because *exact* mesh count and mesh size are the trademarks of Cambridge INDUSTRIAL WIRE CLOTH.

But, quality isn't the whole story. When you call Cambridge for industrial wire cloth, you also get service . . . prompt answers to your inquiries . . . quicker deliveries . . . and an experienced Field Representative who follows up your order to make sure our product is giving you the best possible service. Let us quote on your wire cloth needs. We manufacture wire cloth from any metal or alloy—including titanium—in nine basic weaves. Very likely, we have what you require in our warehouse right now. For samples or more information, call your Cambridge Field Engineer...he's listed in the yellow pages under "Wire Cloth". Or, write for FREE 94-PAGE CATALOG.

**The Cambridge Wire Cloth Co.**

Department H • Cambridge 4, Md.

*Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications*

6957 on Reader Service Slip.

## Association News

### Institute of American Poultry Industries

Chicago, has re-elected Oscar A. Day, Wilson & Co., Chicago, as chairman and re-elected Harold Williams as president. John R. Hargreaves, Federalsburg, Md., has been named vice-chairman; W. F. Priebe, Jr., has been made secretary-treasurer and Opal Ream is assistant secretary-treasurer.

### National Dairy Council

Chicago, has named John A. Moser, Middletown, Ky., dairy farmer and president of the American Dairy Assn. of Kentucky, as its new board chairman. The council also announces the resignation of Dr. Zoe E. Anderson, for the past ten years its director of nutrition research, to become head of Wayne State University's Home Economics Department, Detroit.

### Western Frozen Food Processors Assn.

San Francisco, has changed its name to California Freezers Assn. to identify the group with the state of California. CFA's newly-elected president is Howard Lemon, Sacramento Freezers, Inc., Sacramento, Cal. Kenneth M. Eberts, Stokely-Van Camp, Inc., Oakland, is the new vice president. Thomas B. House continues as secretary and managing director.

### National Preservers Assn.

has elected John S. Phillips, president of Puritan Preserve Co., San Francisco, as its president, succeeding Joseph A. Raphael, Louis Sherry Preserves, Inc. For the past three years Mr. Phillips has been western vice president and director of the association.

For more information on product at right, circle 6960 see information request blank opposite last page.


# water

*comes in oceans, rivers, lakes, wells,*
*drops, buckets, pitchers and glasses.*
*it quenches thirsts, cooks food, puts*
*out fires, makes coffee and*
*brushes teeth. it spins mills,*
*runs electro-plants, cools motors*
*and power factories.*
*it spawns fish, sprinkles lawns,*
*floats boats, washes children*
*and grows flowers.*

*it sustains and nurtures.*
*it bends if you give it purpose.*
*it reshapes itself if you give it reason.*
*it is needed, wanted, feared,*
*praised and prayed for.*

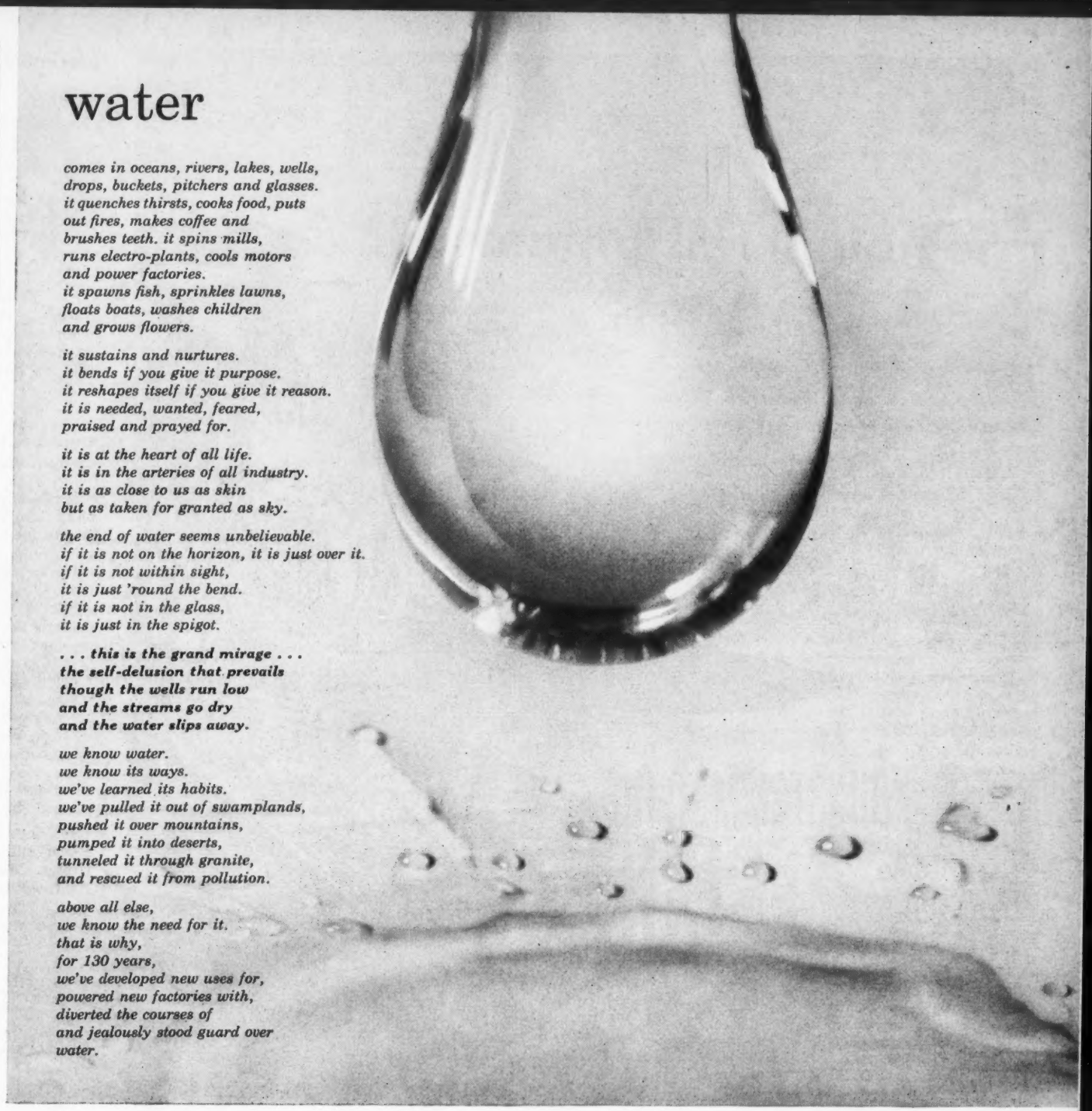
*it is at the heart of all life.*
*it is in the arteries of all industry.*
*it is as close to us as skin*
*but as taken for granted as sky.*

*the end of water seems unbelievable.*
*if it is not on the horizon, it is just over it.*
*if it is not within sight,*
*it is just 'round the bend.*
*if it is not in the glass,*
*it is just in the spigot.*

***. . . this is the grand mirage . . .***
***the self-delusion that prevails***
***though the wells run low***
***and the streams go dry***
***and the water slips away.***

*we know water.*
*we know its ways.*
*we've learned its habits.*
*we've pulled it out of swamplands,*
*pushed it over mountains,*
*pumped it into deserts,*
*tunneled it through granite,*
*and rescued it from pollution.*

*above all else,*
*we know the need for it.*
*that is why,*
*for 130 years,*
*we've developed new uses for,*
*powered new factories with,*
*diverted the courses of*
*and jealously stood guard over*
*water.*



No other manufacturer makes pumps for such a variety of hydraulic applications as Fairbanks, Morse. If it's liquid . . . if it flows . . . we make the pumps that move it . . . at low cost per gallon . . . in sizes from 200 gph to 800,000 gpm, and to 3000 psi . . . for every industrial need.

Our pumps . . . our generators and controls . . . our new rotary compressors . . . our drive toward better ways to de-salt ocean water . . . the potential of our advance Research & Development Center in Beloit . . . our lead position in the field of Hydrodynamics . . . all of these equip us to serve you.

Send for our brochure—"Hydrodynamics." Please write to Mr. Robert W. Kerr, President, Fairbanks, Morse & Company, 600 South Michigan Ave., Chicago 5, Illinois.

# Fairbanks, Morse

A MAJOR INDUSTRIAL COMPONENT OF FAIRBANKS WHITNEY CORPORATION, NEW YORK

(*Continued from page 58*)

and illustrated include condensers, coolers and coils, air handling units, and low-temperature booster, quick-freeze and ice-making systems.

Tables of refrigeration engineering constants are included.

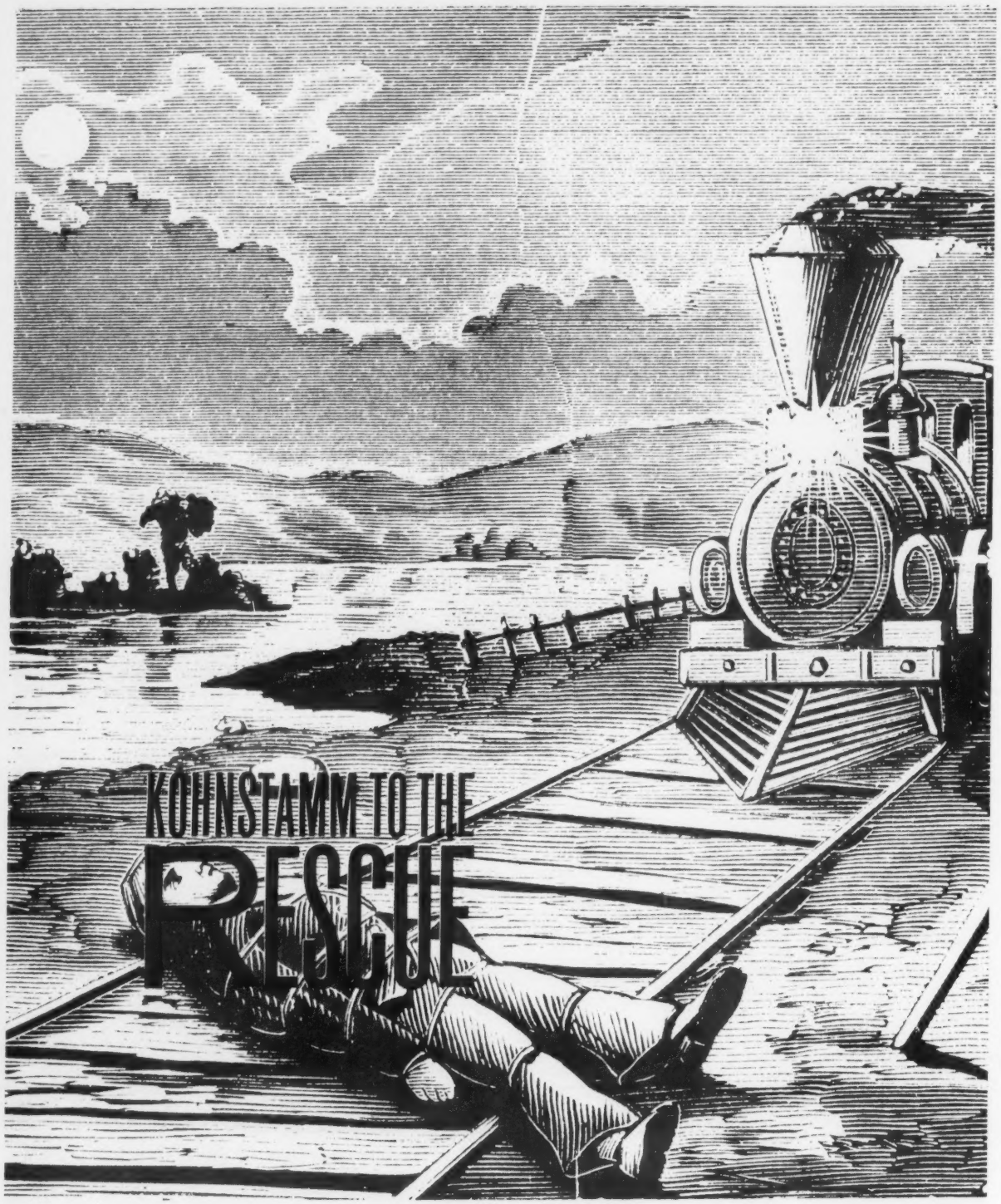
("Air Conditioning, Refrigeration," Bulletin 80-F, is available from Frick Company, Waynesboro, Pa.)
6962 on Reader Service Slip.

### Combines blending, carbonating with bottling

Series of machines are combined into one interconnected system for bottling carbonated soft drinks. Starting with water and sirup, system blends liquids in right proportion, cools, pre-carbonates and temporarily stores them. System finished process by fully carbonating mixture, filling and crowning bottles.

Complete series of machines is diagrammed and explained in eight-page brochure. Features of filler, crowner and other major pieces of equipment are illustrated and explained.

(Brochure on Cem 28-6 Uni-Blend Filler is available from Crown Cork & Seal Co., Inc., Ashton Road, Philadelphia 36, Pa.)
6963 on Reader Service Slip.


WHEN COLOR OR FLAVOR DIFFICULTIES ARE THE VILLAIN, H.KOHNSTAMM IS THE HERO.
WE HAVE WORKED OUT HAPPY ENDINGS TO THIS STORY FOR OVER 100 YEARS.

H. KOHNSTAMM & CO., INC.

SINCE 1851

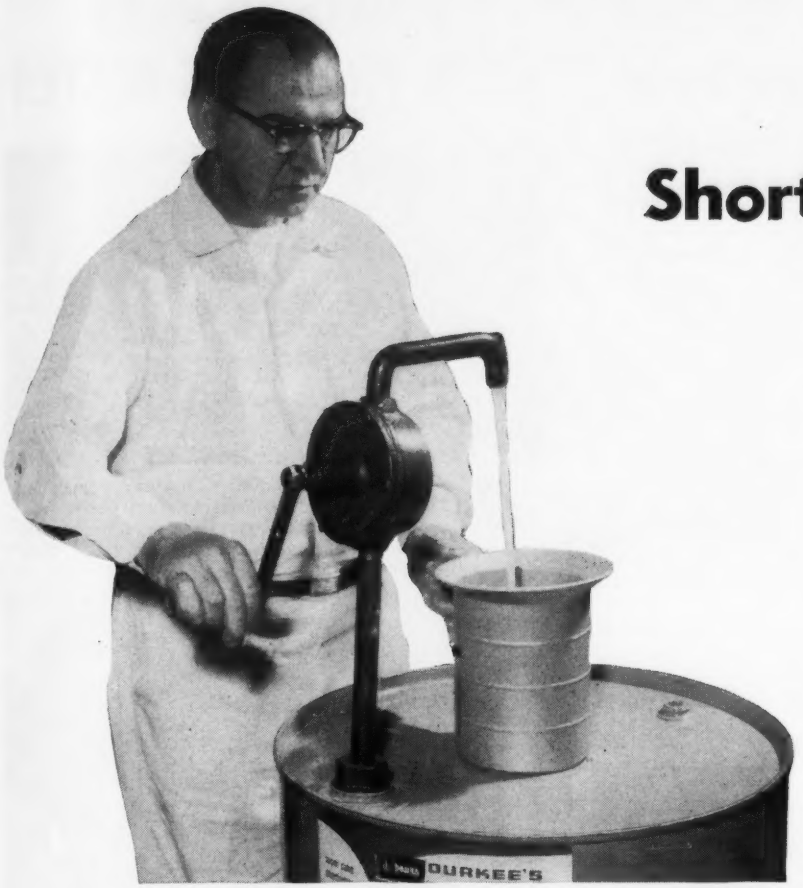
First producers of certified colors. 161 Avenue of the Americas, New York 13; 11-13 E. Illinois St., Chicago 11; 2632 E. 54 St., Huntington Park, Calif.

6961 on Reader Service Slip.

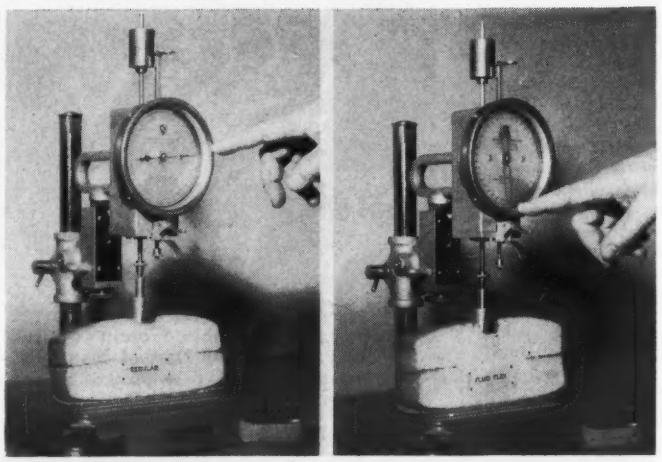
"Keep searching. I want someone who can smile happily on T.V. while munching on our product."

# Shortening In Liquid Form For Every Baker

**All-vegetable, liquid shortening is easier to use and gives an improved product with top volume and longer shelf-life**




Liquid shortening provides easy, fast, measurement as contrasted to handling of plastic shortenings



Longer shelf-life for cakes made with liquid shortening is demonstrated with a comparative penetrometer test used to check tenderness and firmness. Shown are three-day-old cakes. Meter on right indicates penetration of 18.4 millimeters into cake made with liquid shortening. Cake on left, made with regular shortening, shows penetration of only 9.1 millimeters

An all-vegetable, liquid shortening, developed especially for the baking industry, is much easier to use than plastic shortening and produces an improved product with top volume and longer shelf-life.

Key to the new product is suspended emulsifiers in microcrystalline form which are uniformly dispersed throughout the vegetable oil. When added to cake batch formulas, these microcrystalline structures dissolve partly in water to give a quick emulsifying action throughout the batch.

Air is incorporated quickly to give top yield and softer cake texture than with regular shortening. Softer, non-hydrogenated fats provide a better, tenderer texture for cakes.

Liquid shortening practically elminates creaming time and ends time-consuming scooping of plastic shortening from drums. It also eliminates need to scrape shortening down from sides of bowl during mixing operations.

Since it flows freely, it can be pumped, metered or measured directly into the batch, imparting added savings in time and labor. Any system which provides for bulk handling of liquid ingredients can be used in employing the product.

Change in formulation is usually not necessary except that, depending upon the nature of other ingredients in the batch, an increase in the amount of water or milk may be indicated in order to obtain optimum results.

For example, in white cakes, it is advisable to add up to 15% more water than is usually called for in the formula. Any adjustments required can usually be accounted for with a little less mixing and a little more water.

Cake batters made with liquid shortening have a specific gravity of 0.90 to 0.92 as compared with a specific gravity of 0.80 to 0.82 for cake batters made with plastic shortenings.

Liquid shortening is a stable, pourable product with a slight haze caused by the emulsifiers dispersed in microcrystalline form.

It is made from non-hydrogenated domestic vegetable oil with glyceryl lactostearates and mono- and di-glycerides added. It contains not more than 0.01% of propyl gallate, 0.01% of butylated hydroxyanisol and 0.01% of citric acid and propylene glycerol added as preservatives.

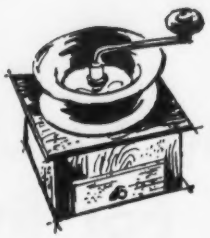
While liquid shortening is presently recommended for use in cakes only, tests are underway, with favorable results indicated, for use in other bakery products.

It is available in ten quart cans or drums or may be delivered in tank vehicles. Cost is one cent per pound more than plastic shortenings.

(Fluid-Flex liquid shortening is a product of Durkee Famous Foods, Division of The Glidden Company, 2333 Logan Blvd., Chicago 47, Ill.)
6964 on Reader Service Slip.

Reg. U.S. Pat. Office

# ENTRAPPED POWDERED SPICE FLAVORS *by* FLORASYNTH



Florasynth was one of the first companies to manufacture powdered flavoring materials; and now makes available a new kind of soluble spice in powdered form—ENTRAPPED POWDERED SPICE FLAVORS which are manufactured and designed for use in industries such as Canners, Baked Goods, Cake Mix, Frozen Foods, Canned Meat, Sausage Manufacture, Meat Packers, Sauces, Soup Mixes, Salad Dressing, etc., and wherever dry powdered flavors can be used to good advantage.

**ENTRAPPED POWDERED SPICE FLAVORS**

1. Are made of special extractions of natural spices which possess all the flavoring qualities and characteristics of the natural spice.
2. Produce a uniform flavor time after time.
3. Give greater uniformity in production.
4. Are much more economical to use in manufacturing processes.
5. Are water soluble and instantly dispersible.
6. Are non-hygroscopic and free flowing.
7. Have a high degree of stability as compared to natural spices.
8. Are ready for immediate use.

| | |
|---|---|
| BLACK PEPPER ENTRAPPED | GINGER, ENTRAPPED |
| CAPSICUM, AFRICAN ENTRAPPED (200,000 pungency) | NUTMEG, ENTRAPPED |
| CELERY, ENTRAPPED | PAPRIKA, ENTRAPPED (40,000 color) |
| CINNAMON, ENTRAPPED | SAGE, DALMATION ENTRAPPED |
| | TURMERIC, ENTRAPPED |

**Other Entrapped Powdered Spice Flavors and Blends of Entrapped Powdered Spice Flavors available as required.**

*Samples and prices on Entrapped Powdered Spice Flavors upon request.*

*Florasynth* **LABORATORIES, INC.**

**EXECUTIVE OFFICES: 900 VAN NEST AVE., (BOX 12) NEW YORK 62, N. Y.**

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Florasynth Labs. (Canada Ltd.) • Montreal, Toronto, Vancouver, Winnipeg
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**Florasynth will exhibit at the San Francisco IFT Meeting—Booths #24, 25**

6965 on Reader Service Slip.

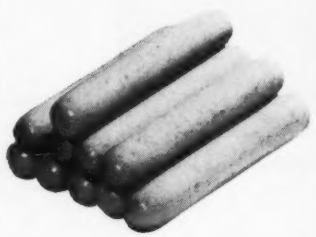
## Increases Storage Life of Frankfurters to Over 30 Days

One-pound packages of frankfurters have an average shelf-life of 8 to 14 days.

Research at the Food Science Department of Rutgers University, using a preservative in the frankfurters, has greatly increased this storage life.

Field trials with four or five major producers of franks has shown that the addition of 0.05 to 0.1% Chemocide PK (propyl ester of p-hydroxybenzoic acid) will extend storage life to over 30 days.

The preservative is added to the chopper during the formation of the emulsion at the same time the seasoning is added. This provides adequate dispersion of the product throughout the frankfurter emulsion before it is stuffed into the natural or artificial casings and smoked.

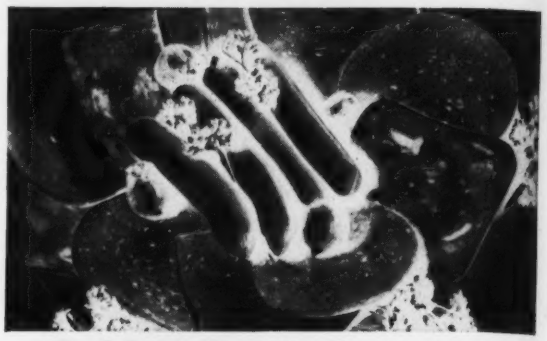


Franks which spoil after 8 to 14 days must be returned to the packer. With production of frankfurters at about 1.2 to 1.5 billion pounds annually, the meat industry suffers losses from about an 8 to 10% return on franks alone due to this problem. Worse, however, is the damage done to a manufacturer's reputation when a housewife buys a package of frankfurters, stores them at home for two or three days and then finds them spoiled

The addition of Chemocide PK has no adverse effect on the development of color or taste or any other physical properties of the frankfurters.

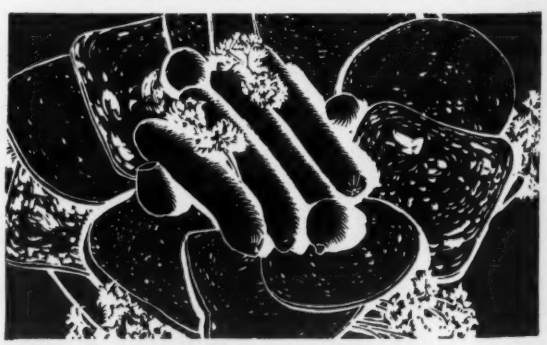
One upstate New York packer, who used to have returns

# 3 WAYS TO MAKE GOOD PRODUCTS BETTER



*Zest*® Staley's Monosodium Glutamate brings out the full-bodied goodness of natural meat flavor. Try it in your own sausages, canned meats, meat loaves and taste the difference a few pennies can make. Easy to use, no formula changes.

**Soy Flour**—Staley's improved Meat Packers Soy Flour gives your meat products better appearance, better texture, less shrinkage. Superior blending properties. Easy to use. Retains more fats and moisture for better eating.



**Hydrolyzed Vegetable Protein**—Staley's new flavor discovery builds eye-appeal too! Natural flavor building characteristics never upset delicate flavor balance. You get better meat products and enjoy better meat sales.

*See the Man from Staley's for further details on these and other profit-building products for the Meat Packing Industry. Or write direct for more information.*

**A. E. STALEY MFG. CO., DECATUR, ILL.**

Branch Offices: Atlanta • Boston • Chicago • Cleveland • Kansas City
New York • Philadelphia • San Francisco • St. Louis

6966 on Reader Service Slip.

as high as 25%, has not had a single package of frankfurters returned since he started using the preservative.

While Chemocide PK has been accepted as safe under the Food Additives Amendment, its use in frankfurters has not yet been sanctioned by the Meat Inspection Division of USDA. Therefore, it may be used only by non-inspected plants at the present time.

(Chemocide PK is manufactured by Chemo Puro Manufacturing Corporation, 150 Doremus Ave., Newark 5, N.J. It is available for use in frankfurters, under an exclusive distribution arrangement, from Preservaline Manufacturing Corp., Flemington, N.J.)
6967 on Reader Service Slip.

### Methyl alcohol in alcoholic beverages*

In the production of alcoholic beverages, the fermentation process generally produces some methyl alcohol. This is a naturally occurring poison.

The Federal Food, Drug and Cosmetic Act recognizes that poisonous substances may occur naturally in foods and provides that such foods shall not be considered adulterated if the quantity of such substance in such foods does not ordinarily render it injurious to health.

It is of course obvious that in the consumption of alcoholic beverages, ethyl and methyl alcohol are ingested simultaneously. The concentration of methyl is of such a low order that there is always a great preponderance of ethyl over methyl.

Since it has been clearly demonstrated that ethyl is very effective in inhibiting the biochemical oxidation of methyl in the body, this combination of fortunate circumstances is quite adequate to demonstrate that the small amounts of methyl alcohol produced in fermented beverages are no health hazard.

*Taken from an article in the October, 1959 Quarterly Bulletin of the Association of Food and Drug Officials.

# PECTINOL®

## for clearer juice, richer sparkle, greater yield

Wouldn't you like to see your fruit juices take on a clear, glowing sparkle and have better sales appeal? You can do it with the help of PECTINOL natural enzymes. Many untreated fruit juices have a characteristic cloudy appearance that persists even after repeated filtering—a phenomenon usually caused by millions of tiny, suspended pulp particles that do not settle because of the protective colloidal action of pectin. PECTINOL enzymes hydrolyze such pectins, the protective-colloid action is destroyed, and the suspended particles settle and make filtration easy.

PECTINOL action on fruit pectins can be helpful in many ways. When mixed directly with crushed grapes or berries, PECTINOL promotes the breakdown of the fruit structure, facilitates pressing, increases the yield of juice, improves color extraction, and speeds filtration. In preparing juice concentrates, PECTINOL prevents premature gelation during evaporation—when the fruit pectins are hydrolyzed with PECTINOL, the juice evaporates uniformly without tending to gel as the water content is lowered. Burning on heating coils is also reduced.

PECTINOL enzymes have been used in preparing juices, extracts, concentrates, purees, jellies, and marmalades from apples, grapes, oranges, prunes, dates, apricots, pears, strawberries, cranberries, blackberries, cherries, grapefruit, lemons, limes, and many other fruits.

*Write to Dept. SP-22 for samples and technical literature.*

*Chemicals for Industry*

**ROHM & HAAS COMPANY**

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

6968 on Reader Service Slip.

### Antibiotics for meat processing

The history and background behind the development of antibiotic Acronize chlortetracycline for application to perishable foods, and detailed information as to the method of application on meat is subject of 44-page bulletin.

No tolerance has yet been approved by FDA for use on meat.

A tolerance of 7 ppm is permitted on poultry in both the United States and Canada.

A tolerance of 5 ppm has been granted for use on fish in Canada and for use on whole, headed, or gutted fish, shucked scallops and unpeeled shrimp in the United States.

Several graphs in the bulletin show the effectiveness of Acronize used to retard spoilage in meat.

("Acronize Chlortetracycline for Meat Processing," 44-page bulletin, is available from American Cyanamid Company, Food Indusry Development Department, 30 Rockefeller Plaza, New York 20, New York.)
6970 on Reader Service Slip.

### New source for sodium caseinate

Refined, edible grade, sodium caseinate is now available from American Casein Company. Material provides a very high content, pure animal protein.

Applications for product include meat fortifying binders, dietetic supplements, whipping agents, ice cream, candies, toppings and bakery mixes.

(Technical and use information on AMCO, edible grade, sodium caseinate may be obtained from American Casein Company, 728 Market Street, Camden 2, N. J.)
6971 on Reader Service Slip.

# What's the hidden magic that makes her buy your brand again...and again?

There are many ways to sell a product once . . . but repeat sales depend on the hidden magic of flavor, performance, texture, economy . . . customer satisfaction with your product.

Fast-growing way to achieve these sales assets is with the improvement added by enzymes. And today Miles Chemical is your best source for enzymes. Takamine products offer the widest variety of enzymes available . . . all highly specific in their actions . . . derived from fungal, bacterial, plant, or animal sources . . . and readily inactivated when their job is done.

Beverage or food product . . . Takamine enzymes can consistently help speed up processing, guard color and stability, enhance flavor, protect shelf life . . . endow your products with the hidden magic that captures repeat customers. Let us tell you more about these willing workers from Takamine. All inquiries are handled promptly.

**TODAY'S WIDEST VARIETY OF ENZYMES**

**Amylases** for any degree or kind of starch conversion in baked goods, beer, cereals, chocolate, confectionery, flavors, fruit juices, syrups, and vegetables.

**Proteases** for limited, selective or drastic proteolysis of most proteins in baked goods, beer, cereals, chocolate, meat and fish, and protein hydrolysates.

**Glucose Oxidase** for removing glucose or oxygen in beer, carbonated beverages, milk, eggs, flavors and juices.

**Catalase** to decompose hydrogen peroxide in cheese and egg processing.

**Pectinase** to increase yields, improve color, and speed processing in fruit juices and wine production.

**Another Takamine food enhancer** is sodium erythorbate (sodium isoascorbate) or erythorbic acid, economical antioxidants widely used to improve flavor, appearance and shelf life of many food products.

**It will TASTE better, LOOK better, SELL better with Takamine products.**

Takamine® **Miles Chemical Company**

(pronounce it Tack-a-ME-nee)

DIVISION OF MILES LABORATORIES, INC., ELKHART, INDIANA

General Sales Office: Elkhart, Indiana, Telephone COngress 4-3111; Clifton, New Jersey, Telephone PRescott 9-4776; New York, N.Y., Telephone MUrray Hill 2-7970.

5-60

6969 on Reader Service Slip.


For more information on product at right, circle 6972 . . . . see information request blank opposite last page.

## CERTIFIED FOOD *Colors*

Tempting, eye-appeal attains its most potent sales effectiveness with Red Seal Colors of unsurpassed brilliance, purity and uniformity. Let Warner-Jenkinson produce—and precisely re-produce—the exact colors to give your products the greatest possible taste-stimulating attractiveness.

**WARNER-JENKINSON MANUFACTURING CO.**

*Manufacturers of Certified Food Colors, Vanillas, Extracts, Flavors*

2526 Baldwin St. • St. Louis 6, Mo.

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# FDA grants time extensions for 33 direct and indirect additives

FDA has announced that 33 direct and indirect food additives may continue to be used up to one year from March 6, 1960. Time extensions have been granted for the following additives with limits and specified uses or restrictions:

| Product | Limits | Specified uses or restrictions |
|---|---|---|
| **DIRECT ADDITIVES** | | |
| Annatto colorants | 35 parts per million (Based on annatto solids) | As coloring in foods |
| Butylated hydroxyanisole and/or butylated hydroxytoulene | 0.001 per cent (combined total) | As an antioxidant in dry mixes for making prepared foods |
| Butylated hydroxyanisole and/or butylated hydroxytoulene, and/or propyl gallate | 0.005 per cent (combined total) | As antioxidants in breakfast cereals |
| Copper pyrophosphate | 0.005 per cent of copper in total daily ration | In mineral mixtures used in concentrated animal feeds |
| Cottonseed flour (cooked and partially defatted) | 5 per cent | In bakery products |
| 3,5-Diiodosalicylic acid | 300 parts per million | In salt blocks for animal use |
| Ethyl cellulose | 35 per cent by weight | In dry vitamin preparations for animal feed and human food use |
| Fumaric acid | 0.3 per cent | In foods as an acidulent, flavoring and leavening agent |
| Polyoxyethylene (20) sorbitan monooleate | 0.1 per cent | In frozen deserts (other than water ices), as an emulsifier |
| Polyoxyethylene (20) sorbitan monooleate | 0.1 per cent | In imitation ice cream, as and emulsifier |
| Polyoxyethylene (20) sorbitan monooleate | 0.05 per cent | In pickles, as an emulsifier |
| Polyoxyethylene (20) sorbitan monooleate | | As an emulsifier in flavored foods when used at rate not to exceed nine parts by weight per one part of flavor |
| Polyoxyethylene (20) sorbitan monostearate | 0.475 per cent | In cakes, as an emulsifier |
| Polyoxyethylene (20) sorbitan monostearate | 0.45 per cent | In cake icing, as an emulsifier |
| Polyoxyethylene (20) sorbitan monostearate | 0.5 per cent | In confectionery coating, as an emulsifier |
| Polyoxyethylene (20) sorbitan monostearate | 0.2 per cent | In sugar confectionery pan coatings, as an emulsifier |
| Polyoxyethylene (20) sorbitan monostearate | 0.4 per cent | In whipped topping, as an emulsifier |
| Polyoxyethylene (20) sorbitan monostearate | | As an emulsifier in flavored foods when used at rate not to exceed nine parts by weight per one part of flavor |
| Polyoxyethylene (20) sorbitan tristearate | 0.1 per cent | In frozen desserts (other than water ices), as an emulsifier |
| Polyoxyethylene (20) sorbitan tristearate | 0.1 per cent | In imitation ice cream, as an emulsifier |
| Quinine sulfate | 0.01 per cent | As flavoring agent in carbonated beverages |
| Sorbitan monostearate | | As an emulsifier in flavored foods when used at rate not to exceed nine parts by weight per one part of flavor |
| Sorbitan monostearate in combination with polyoxyethylene (20) sorbitan monostearate | 0.475 per cent | In cakes, as an emulsifier |
| Sorbitan monostearate in combination with polyoxyethylene (20) sorbitan monostearate | 1.0 per cent | In confectionery coating, as an emulsifier |
| Sorbitan monostearate in combination with polyoxyethylene (20) sorbitan monostearate | 0.4 per cent | In whipped topping, as an emulsifier |
| **INDIRECT ADDITIVES** | | |
| Bromides, inorganic | 50 parts per million | In processed foods from methyl bromide fumigation |
| Carbon tetrachloride | | As a fumigant in food plant use |
| Coumarone-indene resin | 200 parts per million | In coating on citrus fruits |
| Chloropicrin | | As a fumigant in food plant use |
| Dibutyl phthalate | | Not to exceed 2.17 per cent in nitro-cellulose-coated, heat-sealing cellophane for packaging foods |
| Dicyclohexyl phthalate | | Not to exceed 2.17 per cent in nitro-cellulose-coated, heat-sealing cellophane for packaging foods |
| Ethylene dibromide | | As a fumigant in food plant use |
| Ethylene dichloride | | As a fumigant in food plant use |
| Maleic acid | | Not to exceed 0.09 per cent in nitro-cellulose-coated, heat-sealing, cellophane for packaging foods |
| Mineral oil | | Not to exceed 2 per cent in fiber bags to contain dry foods |
| Mono fatty acid ester of polyethylene glycol | | Not to exceed 0.8 per cent in film wrappings for foods |
| Pentaerythritol tetrastearate | | Not to exceed 0.09 per cent in nitro-cellulose-coated, heat-sealing, cellophane for packaging foods |
| Piperonyl butoxide | | As a fumigant in food plant use |
| Polymers of primaric and abietic acids and/or rosin constituents | | Not to exceed 0.64 per cent in nitro-cellulose-coated, heat-sealing, cellophane for packaging foods |
| Polyoxyethylene (20) sorbitan monooleate | | Not to exceed 1.48 per cent in film wraps for meat, as an emulsifier |
| Propylene oxide | | As a fumigant in foods |
| Pyrethrins | | As a fumigant in foods |
| Tetraethylene pentamine | | Not to exceed 1.77 per cent in coatings for food-storage containers |
| Titanium dioxide | | Not to exceed 20 per cent in adhesives for food packages |

**FDA "sanctions" for food additives to be listed in May issue**

The May issue of FOOD PROCESSING will feature a list of ingredients and food additives authorized as safe for *intentional* use in foods by correspondence from FDA.

Most of these additives have not been published heretofore because it is FDA's policy to regard any correspondence it has on them as private, publishable only at the discretion of the recipient.

Therefore, FOOD PROCESSING went directly to manufacturers and suppliers to compile this listing. Complete list will be made available at a later date in reprint form as a service to the industry.

### All-vegetable divider oil

A 100 per cent, all-vegetable divider oil is available for use in the baking industry will all types dividers.

Containing absolutely no mineral oil, it is a clear liquid oil, full-bodied, virtually tasteless and non-oxidizing. Oil will not gum up in the divider.

It offers better lubricating value, resulting in considerable economy of use and longer life to the wearing and contact parts of equipment.

Divider oil is available in 415-pound, net, non-returnable bunghole steel drums.

(All-vegetable divider oil is product of Mallet & Company, Inc., PO Box 474, Carnegie, Pennsylvania.)
6973 on Reader Service Slip.

### Over 700 flavor listings

Over 700 flavorings for food processors are listed in 28-page reference list. List includes packaging sizes and cost for each item.

Listings are broken down for individual specialties. Among specialties included are 267 essential oils, 72 imitation flavors for confections, 16 imitation flavors for bakery foods, 18 flavors for icings, jellies and fillings, 34 liquid imitation flavors for gelatin dessert powders and pudding powders, 38 spray-dried flavors and 62 miscellaneous flavor specialties.

(Flavoring ingredients, Reference List No. 60, is available from Ungerer & Co., 161 Avenue of the Americas, New York 13, N. Y.)
6974 on Reader Service Slip.

**READER SERVICE**

For your copy of technical literature described in this section . . . use the convenient self-mailing Reader Service Slip located opposite the inside back cover.

Booth **No. 75** • **I.F.T. Exhibit** • San Francisco • **May 15-18,** 1960

**CLINTOSE**
**CORN OIL**
**CORN SYRUP**
**LACTIC ACID**
**PRODUCTS**
**FROM CORN**

Food processors interested in properties, uses or problems regarding products from corn... consult with our staff of Food Technologists and Chemists.

**CLINTON CORN PROCESSING COMPANY**
**CLINTON, IOWA**

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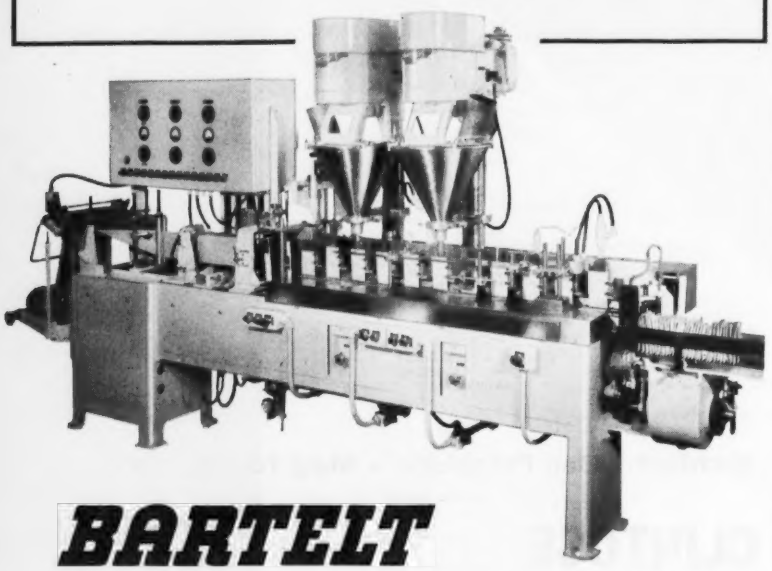
# ENGINEERED PACKAGING PROTECTION



**BARTELT**

## Packaging Machinery Has Built-in Versatility to Meet Changing Market Requirements . . .

**PROTECTION** . . . for changing package sizes and products. The Bartelt Packager can be tooled to handle a variety of products and a wide range of package sizes.

**PROTECTION** . . . for your product. Pouches can be made from inexpensive webs or the finest barriers depending on product shelf-life requirements.

**PROTECTION** . . . against high labor costs. Completely automatic from roll stock to finished package.

**PROTECTION** . . . against maintenance problems and excessive down-time losses. Bartelt's straight-forward design and rugged construction assure efficient operation.

● **Write Today for Bartelt Brochures**

**BARTELT ENGINEERING COMPANY**
1900 Harrison Ave., Rockford, Ill. • New York Office: 370 Lexington Ave. N.Y.C.

6976 on Reader Service Slip.




M/R board boxes filled with pascal celery stand strong and straight in rail-car after 2700 mi trip from Oceano, Calif., to Buffalo, N. Y. Some snow ice still remains on carton layers

# Wax-impregnated prod pass cross- coun

**Withstand hydro-cooling, top icing, rough handling without bulging**

After initial snow ice is shoveled into box and four dozen bunches of onions are packed (lower), employee adds final ice layer. Second worker staples top flaps shut

NEW kind of linerless, moistureproof corrugated container, introduced about a year ago after successful field-test-evaluation shipments of fresh peaches (FP, Feb. 1959, p 65) has proved itself commercially in cross-country shipments of pascal celery and fresh green onions.

The shipments marked the first time a celery packer has taken advantage of the simplified packing and handling, and the reduced tare weight provided by corrugated boxes made of M/R board.

Several full carloads of celery, packed in these boxes, have spanned the country from Phelan and Taylor's Oceano, Calif., headquarters to such Eastern markets as Chicago, Saginaw, Mich., To-

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On arrival in Milwaukee, M/R board boxes of green onions shipped from Phoenix still were sturdy. Gaps between upper and lower flaps and slots in side allow slow-melting ice to drain

## produce cartons country tests

ledo and Buffalo.

Each shipment has been completely successful, even though some of the hottest summer weather of the year was encountered, and distances ranged up to 2700 mi.

Stalks of celery were placed in the boxes wet (see photograph following), 12 stalks to the box. Gross weight of packed box was 34 lb.

Boxes were designed to contain the product without bulging — thus minimizing bruises and abrasions to the produce that previously have reduced market quality and resulted in trim waste.

In addition to top-icing of the load with 15,000 lb of snow ice, the cars were bunker-iced prior to leaving California, and then again enroute East. A major portion of the snow ice remained on load at destination.

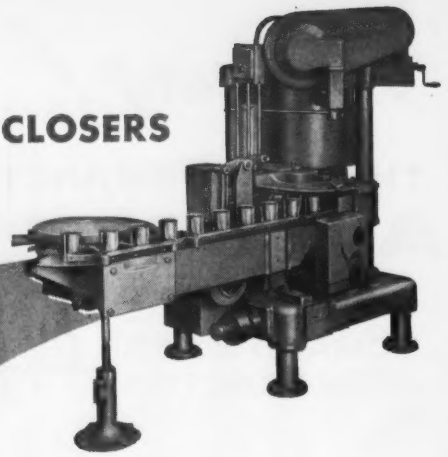
Although the boxes in each shipment thus were subjected to large amounts of moisture inside and outside during the seven-day cross-country trip, there was little or no evidence of their having been affected.

After the first several carloads, top icing was reduced to a minimum. Idea was to ice sufficiently to guarantee good delivery, but to have load arrive at destination with as little snow ice as possible — thereby permitting unloading without need of shoveling.

On the first carload shipped to Buffalo (with the above-mentioned 15,000 lb of snow ice, plus bunker icing), consignee's inspector stated that the carload of celery in M/R board containers could be unloaded 40 per cent faster than had shipment been made in wooden boxes.

After reducing the top ice from the usual $65 worth to only $20 worth, even this unloading advantage was exceeded — at a $45 saving to


ANGELUS CAN CLOSERS



KNOWN FOR THE COMPANY THEY KEEP...
KNOWN FOR THE SERVICE THEY PROVIDE

Minute Maid ® · TEXACO ® · NESTLE ® · AJAX ® CLEANSER · HERSHEY'S ® · Hunt ® · General Mills ®

No better recommendation exists than the list of "blue chip" customers who use one or more models of Angelus Closing Machines for efficient and cost-cutting service.

The performance of Angelus Closing Machines is based not only on top-grade materials and quality of workmanship but on the right design to meet specific production problems. These leading canners know that Angelus, the only company in the world producing can closing machines exclusively, devotes all of its design efforts to create equipment for greatest production efficiency and easiest possible maintenance.

Let Angelus put its 50 years of experience to work in solving your can closing production problems. Write today for complete details. Specify products, can dimensions and your capacity requirements.

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Sanitary Can Machine Company
Cable Address "Angelmaco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.

6977 on Reader Service Slip.

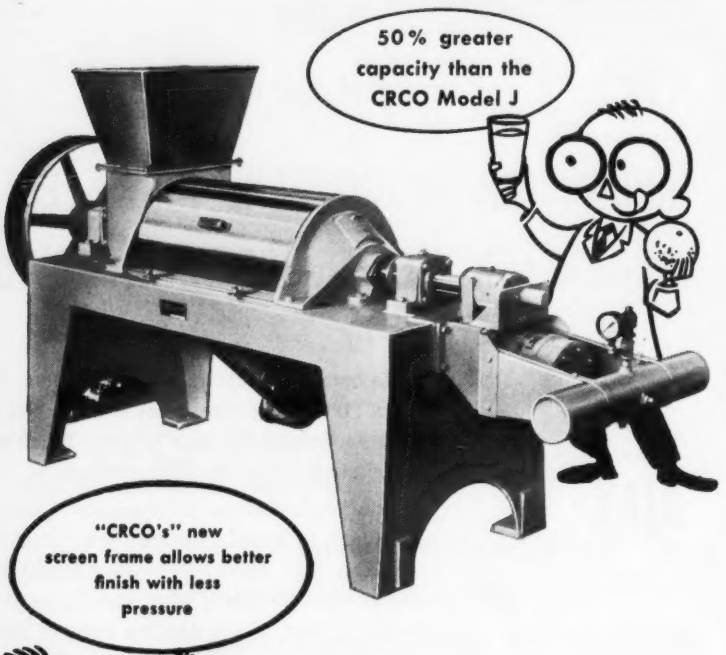
*Amazing!*

THE PERFORMANCE OF THE NEW

**AIR CONTROLLED**

MODEL TJE
TOMATO JUICE
EXTRACTOR

by CRCO*
*SAY "SEE-AR-CO"




- **AIR CONTROL** provides precise means of controlling solid content in juice by varying the air pressure and maintains constant pomace pressure on changing positions of the screw.
- **AIR CONTROL** maintains constant pressure with varying product flow and gallonage; allows adjusting of pomace dryness without stopping the extractor.
- **AIR CONTROL** can be connected to a recording instrument and even locked.
- **NEW SCREEN FRAME** provides greater available screen surface.
- **NEW SCREEN FRAME** increases capacity with less pressure and produces better juice.

*Write for complete information.*

THE BEST OF Everything

**CHISHOLM-RYDER CO. INC.**
*Niagara Falls, New York*
FOR THE FOOD PROCESSOR

6978 on Reader Service Slip.




the receiver.

During the late fall lettuce-packing season, Phelan and Taylor officials gained an additional advantage from the M/R board cartons — in the field. During several days of heavy rain, packing operations continued without containers becoming soggy. If muddy, the cartons simply were washed off.

**Savings with onions.** In another application — an 1800-mi shipment of fresh green onions from Phoenix, Ariz., to Milwaukee, Wis. — the Royal Packing Company of Phoenix, saved an average 18 cents per unit.

Box holds 15 lb of onions (four doz bunches) and 28 lb of ice. Note water on flaps

Moreover, after seven days in transit, the boxes were firm and sturdy, and the hydrocooled, top-iced onions arrived at market fresh and crisp.

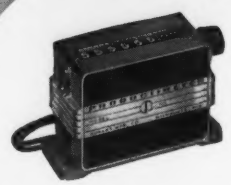
Besides paying less for the new boxes than for conventional wooden crates, four fewer employees were needed to pack boxes of M/R board than to fill crates, and the packing actually was faster.

Royal was able to pack 1000 doz bunches of onions every hr, as compared with 800 doz bunches packed in wooden crates.

Shipping costs were reduced, too. Corrugated boxes made of M/R board are lightweight, hence cost less to ship. Because they insulate better than wooden crates, no carload topicing for rail shipment was required — another cost reduction.

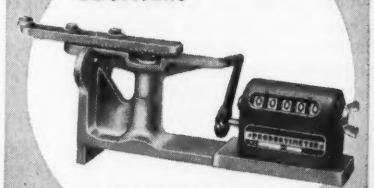
Greater flexibility in order


**Count ALL PRODUCTION**
*with accurate, dependable*
**DURANT PRODUCTIMETERS**


ELECTRIC COUNTER

HEAVY DUTY STROKE ACTION

BOTTLE AND CAN COUNTERS


CASE COUNTER

Eliminate profit-eating losses . . . Productimeters register accurate count of every unit processed . . . insure economical plant operation and maximum use of man hours.

**DURANT MANUFACTURING CO.**

Send for CATALOG 51-55

1951 N. Buffum St., Milwaukee 1, Wis.
51 Thurbers Ave., Providence 5, R.I.
*Representatives in Principal Cities*

DURANT
COUNTING INSTRUMENTS

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filling was still another major benefit. Smaller size of the new boxes minimized case splitting by commission agents, allowed order filling in multiples of four and five doz, rather than multiples of eight doz formerly required.

All-in-all, Royal officials found that the new boxes saved money, set up quickly, handled easily, required no liners, lids or labels and eliminated the hazards of splintering and cracking.

(Produce-shipping cartons of M/R corrugated board are manufactured by Hinde & Dauch Division, West Virginia Pulp and Paper Company, 407 Decatur St., Sandusky, Ohio.) 6980 on Reader Service Slip.

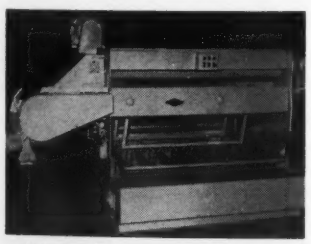
### Unscrambles cans to quart size at 500-1000/min

**Uses:** Automatic can sorter is designed for high-speed unscrambling of cans up to one-qt size, especially where limited space is a consideration.

**Features:** Unit features unique magnetic pulley to turn the cans so that open ends all are in the same direction — ready for the filling cycle.

**Description:** In operation, scrambled cans are fed into bottom of can sorter. Oscillating rubber "sweeps" lay the cans end-to-end in rubber-covered channels or flights.

These flights lift the aligned cans, with their ends at ran-

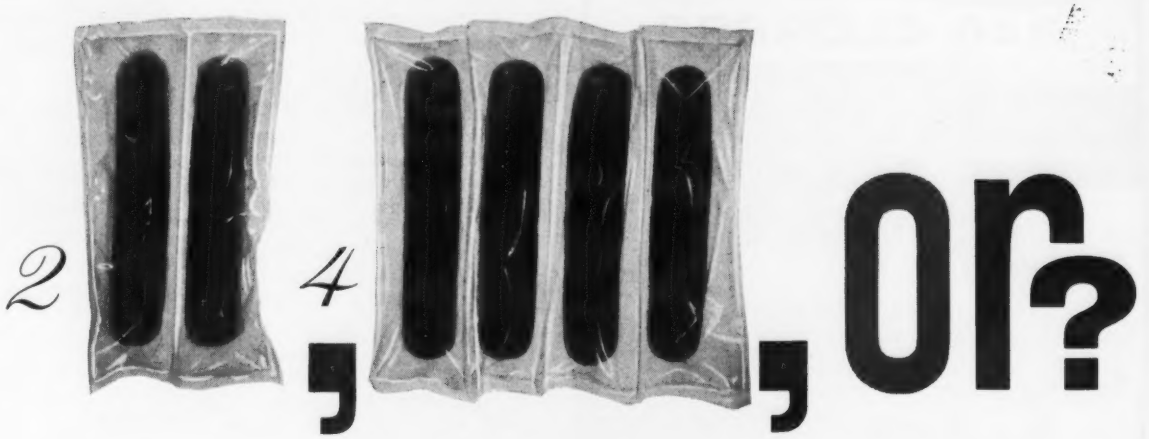


Unit handles up to 1000 six-oz, 750 twelve-oz, 575 sixteen oz and 500 thirty-two-oz cans per min

dom, to top of can sorter where they are released in rows to single-file carrier belts which carry the cans to final sorting mechanism — the magnetic pulley.

Latter, acting on the greater


**3M PRESENTS** . . . creative packaging ideas by distinguished designers.



HARLEY EARL

**Harley Earl Associates design in "Scotchpak"**—the heat-sealable polyester film. From this crack creative staff, a new boil-in-the-bag portion-pack for wieners. Tough, heat-sealable **"Scotchpak"** retains flavor, provides convenience, permits addition of sauces, condiments. Merchandises and displays well, too. Design also adapts to other foods — cigars, shotgun shells. Try **"Scotchpak"**— the film of the future for your new design ideas today. Write **Film Products Group,** 3M Co., 900 Bush Avenue, St. Paul 6, Minnesota—Dept. CAH-40

"SCOTCHPAK" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN. EXPORT: 99 PARK AVE., NEW YORK 16, CANADA: LONDON, ONTARIO

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

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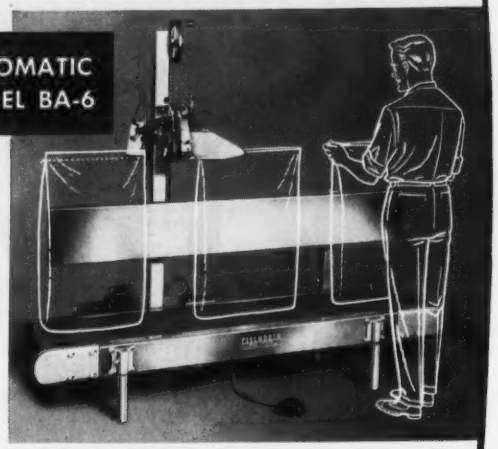
FISCHBEIN LOW COST EFFICIENT
BAG CLOSERS




Bags start the sewing operation when they reach the head. After sewing, thread is cut automatically and conveyor belt continues to move bag. Instantaneous start/stop controls.

WRITE FOR COMPLETE CATALOG FILE OF BAG CLOSING EQUIPMENT

DAVE FISCHBEIN CO., Dept. 2A
2720 30th Ave. S., Minneapolis 6, Minn., U.S.A.

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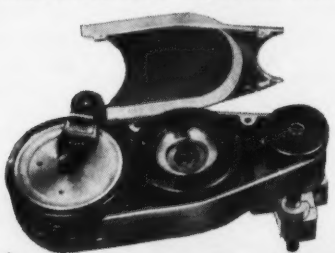
NOW! CONTINUOUS CODING ACTION

with minimum maintenance



NO FLUID INK!

The revolutionary
TEKO CODER with PORELON*

Fully automatic . . . friction operated . . . designed for heavy-duty continuous coding . . . can be used in any position on packaging and materials handling machines. Revolutionary new Porelon*, a micro-porous plastic, holds ink in suspension for up to 150,000 unsmudged, legible impressions, eliminates need for ink fountains, transfer rollers, fluid inks, solvents, and the mess and fuss of their maintenance.

See it at Booth No. 1003 at the AMA Packaging Exposition, or write for complete information.

TEKO with PORELON*
The THOMAS ENGINEERING COMPANY
9257 N. LARAMIE AVE., SKOKIE, ILLINOIS
*Porelon is a trade-marked product of S. C. Johnson & Son, Inc.

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mass of the can bottom, properly orients the cans and feeds them to a can elevator or directly to the filler conveyor.

Models are available to handle all standard cans to 32 oz, or any group of can sizes — provided the smallest can is approximately one in. longer than the diam of the largest can.

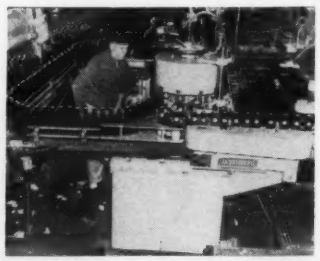
Rubber bin sweeps and rubber-edge flights protect finish of cans, and will not bend or damage open ends.

(Atkron Dumore automatic can sorter, Model CUS 6.5d, manufactured by Atkron, Inc., Cuyahoga Falls, Ohio, is distributed exclusively by Geo. J. Meyer Manufacturing Co., Box 452, Milwaukee, Wis., and Economic Machinery Co., Div. of Geo. J. Meyer Manufacturing Co., 60 Fremont St., Worcester 3, Mass.)
6984 on Reader Service Slip.

### Applies body, neck labels simultaneously at rate of 300 bottles per min

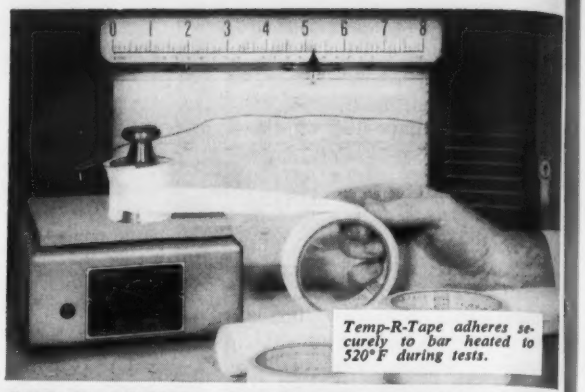
**Features:** Operating speeds are in heretofore unheard-of range of 300 bottles per min for paper labels or 250 per min for foil labels — applied simultaneously to body and neck of bottle.

For even higher production rates, unit is easily tandemized — either to conform to a long and narrow area or a short, wide area. Optional straight-through or right-angle discharge further increases layout flexibility.



Machine occupies only 3½ by 5 ft on bottling floor

**Description:** Labeler applies glue thinly to entire surface of body and neck labels. A combination of squeeze-wip-


CHR PRESSURE-SENSITIVE TEFLON® TAPES

- *−100°F to 500°F applications*
- *Class H and Class C insulation*
- *Non-stick and low friction facing*
- *Chemical resistant facing*
- *Easy to apply*

Temp-R-Tape is available from stock in rolls and sheets. All four types — Temp-R-Tape T; TH; C and TGV — combine some form of Teflon backing with silicone polymer adhesive to provide easy-to-apply pressure-sensitive and thermal curing pressure-sensitive tapes for electrical and mechanical applications. Designed for extreme temperatures, Temp-R-Tapes possess high dielectric strength, low power factor, high elongation, negligible moisture absorption, are non-corrosive and non-contaminating.

FREE SAMPLES and folder — write, phone or use inquiry service.

Sold nationally through distributors
CHR CONNECTICUT HARD RUBBER
*duPont TM
Main Office: New Haven 9, Connecticut

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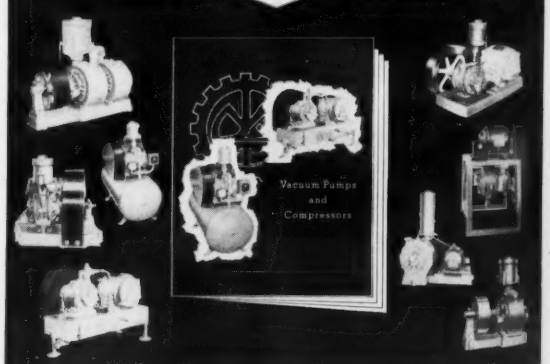
IF YOU NEED
VACUUM
IN YOUR PROCESSING WORK
YOU NEED THIS




Lammert's fact filled catalog should be in your files. Refer to it whenever you need a dependable, sensibly priced vacuum pump or compressor.

Lammert vacuum pumps like these are available in capacities from 4.3 to 250 C. F. M. Medium to high vacuum (up to 20 microns of barometer).

LAMMERT & MANN CO., INC.
1753 Walnut Street, Chicago 12, Illinois, SEeley 3-0383

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ing and brush-wiping produces a smooth quality of labeling comparable to standards demanded for costly cosmetic, pharmaceutical or spiritous products.

(Jagenberg "Ultra-Tempo" Labeler, manufactured by Jagenberg Werke, A.G., Dusseldorf, West Germany, is being imported into the US by Pneumatic Scale Corp., Ltd., 77 Newport Ave., Quincy 71, Mass., who plan early US manufacture of the machine. Sales, service and installation in the US in the brewing and carbonated beverage industries are handled by Barry-Wehmiller Machinery Co., 4660 W. Florissant Ave., St. Louis 15, Missouri.)
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**Inner coating repels water, yet lets cartons 'breathe'**

Chemical also checks grease penetration in meat shipments

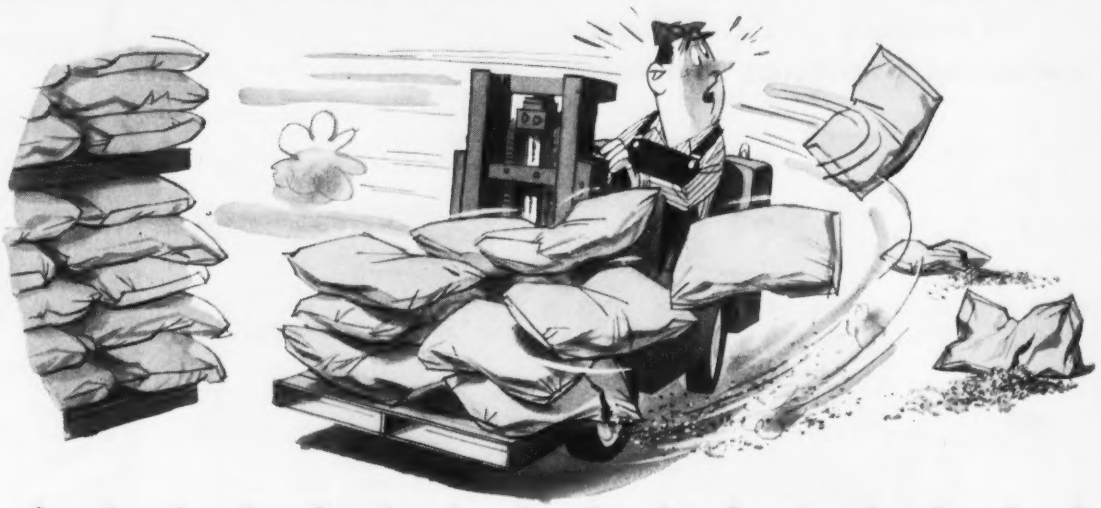
Soon after Oscar Mayer & Co., Madison, Wis., switched from wirebound, wooden boxes to corrugated cartons for shipping refrigerated pork loins and bulk hams, it was found that meat juices and refrigeration condensates formed pools that discolored and weakened box bottoms.

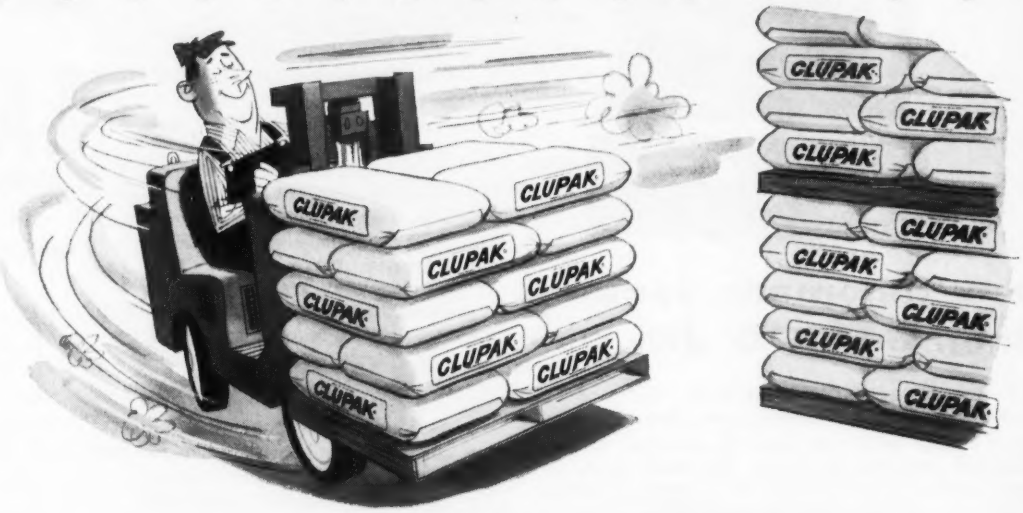
While this had no effect on meat quality, it was unsightly. Outer wrappings of ready-to-eat hams often were stained, placing them at competitive disadvantage in the stores.

Slits in the tops of the car-

Meats arrive clean and fresh-looking; sodden, discolored cartons are eliminated


# END BAG DAMAGE... use multiwalls made of CLUPAK* extensible paper!






## NEW, TOUGHER KRAFT SOLVES BREAKAGE PROBLEMS

New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK extensible paper in your kraft bags, you solve your breakage problems once and for all. And multiwalls of CLUPAK extensible paper fill faster, palletize better and handle easier.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK extensible paper, as part of your next bag order. Use the CLUPAK trademark when ordering and look for it on the bags. Only then can you be sure the bag paper meets the rigid strength specifications established by Clupak, Inc. for your benefit.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

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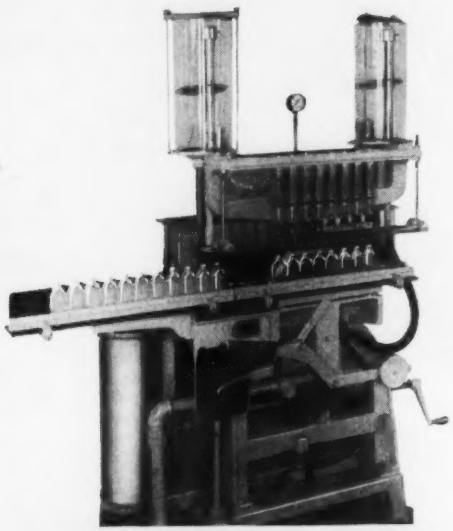
**PROBLEM**

**Limited production—several product types**



**ANSWER**

**Semi-automatic vacuum filling, SAMCO JR. style**

This machine was "tailored to fit" the need for no-drip vacuum filling of smaller runs. Handles a variety of liquids and a wide range of container sizes . . . from one ounce to one gallon. Six filling heads . . . with room for more if desired. Very simple to adjust — only 5 to 10 minutes required for size changes.

It's the ideal in-between filling machine — time tested and proved beyond question in plants where flexibility is a "must" requirement. Write for complete information.

another **SEMI-AUTOMATIC** by **PNEUMATIC**

Pneumatic Scale Corp., Ltd.
75 Newport Avenue, Quincy 71, Mass. *Branches, Chicago and New York*
Please send us complete information on Samco Jr.

NAME_____ Position_____

COMPANY_____

ADDRESS_____

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tons solved the problem in transit, as up-and-down movement created a bellows-like action that resulted in substantial air movement within the cartons.

However, when the cartons stood still for any length of time, moisture again collected.

**Boxes look better and maintain strength better after grueling shipment**

The fresh pork meats themselves exuded moisture, further dampening the air within the container.

An interior coating was needed that would provide water repellency without clogging the boxes' pores, and thus impairing air circulation.

At first, paraffin was tried. However, these coatings cut off circulation completely. During refrigeration they became brittle and often cracked, particularly where bones rested.

Oscar Mayer's packaging people then tried "Quilon," a chrome complex that acts as a water repellent, but does so chemically without reducing breathability.

Tests with loins and hams allowed to stand under simulated shipping conditions for seven to 10 days—approximately double the time necessary for a shipment to the West Coast—produced outstanding results.

Discoloration and moisture saturation were practically eliminated. "Quilon" now is a standard treatment in all of Oscar Mayer's ham and loin cartons, and also is used on lard wrappings to check grease penetration.

("Quilon" chrome complex water repellent coating is manufactured by E. I. du Pont de Nemours & Company, Inc., Wilmington 98, Del.)
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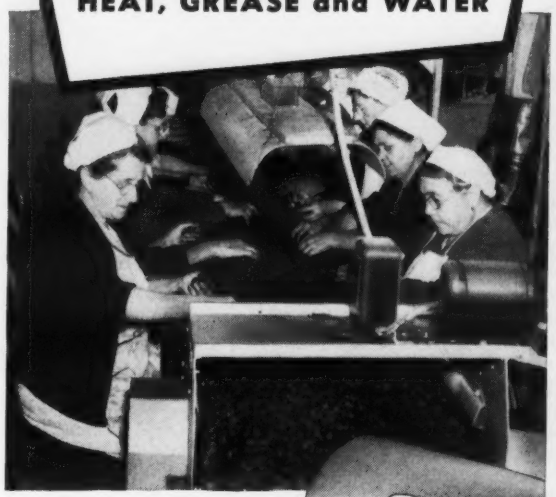
**The CONVEYOR BELT that *RESISTS ACIDS* HEAT, GREASE and WATER**



**LATEX CONVEYOR BELTING for CANNERIES & DAIRIES**

200 SIZES
35 WIDTHS
7 THICKNESSES

Economy-minded canners and dairy men have found in our LATEX belt the answer to all their problems. This solid-woven cotton belt is impregnated and coated with neoprene latex and is completely resistant to water, acids, grease and heat. Odorless and pliable to –40°F., this high tensile belt not only has a LONGER LIFE expectancy than most belts but COSTS LESS. Loaded with special features for canners, dairies and food storage plants, yet it's in the price range of run-of-the-mill conveyor belts. Get the facts and you'll decide on BUFFALO LATEX.

*Send for Free Manual*

that fully illustrates and describes our belts, their sizes, prices and uses.

**BUFFALO** WEAVING AND BELTING CO., INC.
204 CHANDLER STREET BUFFALO 7, NEW YORK
NEW YORK • CHICAGO
We also manufacture a complete line of WEBBINGS & PURE SHEET RUBBER

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### Printing polyethylene film or molded containers

According to new booklet, which brings under one cover the basic information pertaining to printing on polyethylene, one of most important factors is proper treating.

Hence, booklet's first section is devoted to different types of treating — chemical, flame and electronic — and effects of treater variables on ink adhesion.

Section two deals with all known methods for printing polyethylene. Short explanations, illustrated by schematic diagrams, are given for the flexographic, rotogravure, silk screen, transfer ("roll leaf stamping") and offset printing procedures. Embossing, too, is briefly described.

Inks for the various printing techniques are discussed, along with pigments, additives and solvents.

Last two sections explain methods used to test ink performance and provide a glossary of printing term definitions.

(Technical data brochure — "Printing of Polyethylene" — 16 pp, is available from U.S. Industrial Chemicals Co., Division of National Distillers and Chemical Corp., 99 Park Ave., New York 16, N.Y.)
6992 on Reader Service Slip.

### Selecting and handling molded plastic containers

"Why plastics?" for food packaging is first question considered in this monograph booklet, written by a pioneer in the molded plastic food container industry.

Booklet then considers types of plastic — polyethylene, general purpose polystyrene and impact polystyrenes, types of plastic containers, and in-plant handling of such containers.

("The Manual of Molded Plastic Food Containers," 12 pp, is available from Florsheim Manufacturing Co., Inc., 22 W. Monroe St., Chicago 3, Illinois.)
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# NEW!

# JOHNS-MANVILLE ADSORBENTS

Now you can turn to one major source of supply for your speciality adsorbent needs. Johns-Manville introduces Celkate® synthetic magnesium silicates and Micro-Cel® synthetic calcium silicates—first of a new line of adsorbents developed for a wide range of uses in industry.

Painstaking laboratory tests and actual plant operations have proved the efficiency of these adsorbents in removing free fatty acids from vegetable and animal oils, solvents, and lard . . . in removing color and odor from lard, edible oils, naphthalene, stearates, and kerosene.

The unusually light color of Celkate and Micro-Cel make them adaptable to countless industrial sorption problems. They provide distinct flavor improvements in the processing of many foods. They are also used in the sorption of soluble iron from glacé syrups.

Next time you need adsorbents or assistance with a related problem, contact your nearby Johns-Manville Celite* engineer first. After studying your problem he can offer specific recommendations or refer it to the Johns-Manville Research Center for additional analysis. Send the coupon for his location and more complete information. You obligate yourself in no way.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

| SOME TYPICAL PROPERTIES | | |
|---|---|---|
| Type | Micro-Cel synthetic calcium silicate | Celkate synthetic magnesium silicate |
| Color | off-white | off-white |
| loose weight (lb/cu. ft.) | 12.7 | 13.5 |
| Absorption, % by wgt. | 260 (water) | 170 (oil) |
| pH | 9.6 | 7.5 |
| Wet density (lbs/cu. ft.) | 17.4 | 22.5 |
| 150 Mesh (residue) | Trace | Trace |
| Moisture % (free) avg. | 6.5 | 3.5 |

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville, Box 14, New York 16, N. Y.
*In Canada:* Port Credit, Ontario.

Please send me additional information on the new J-M Adsorbents. I have the following application(s) in mind:_____

_____

_____

_____

Name_____ Position_____

Company_____

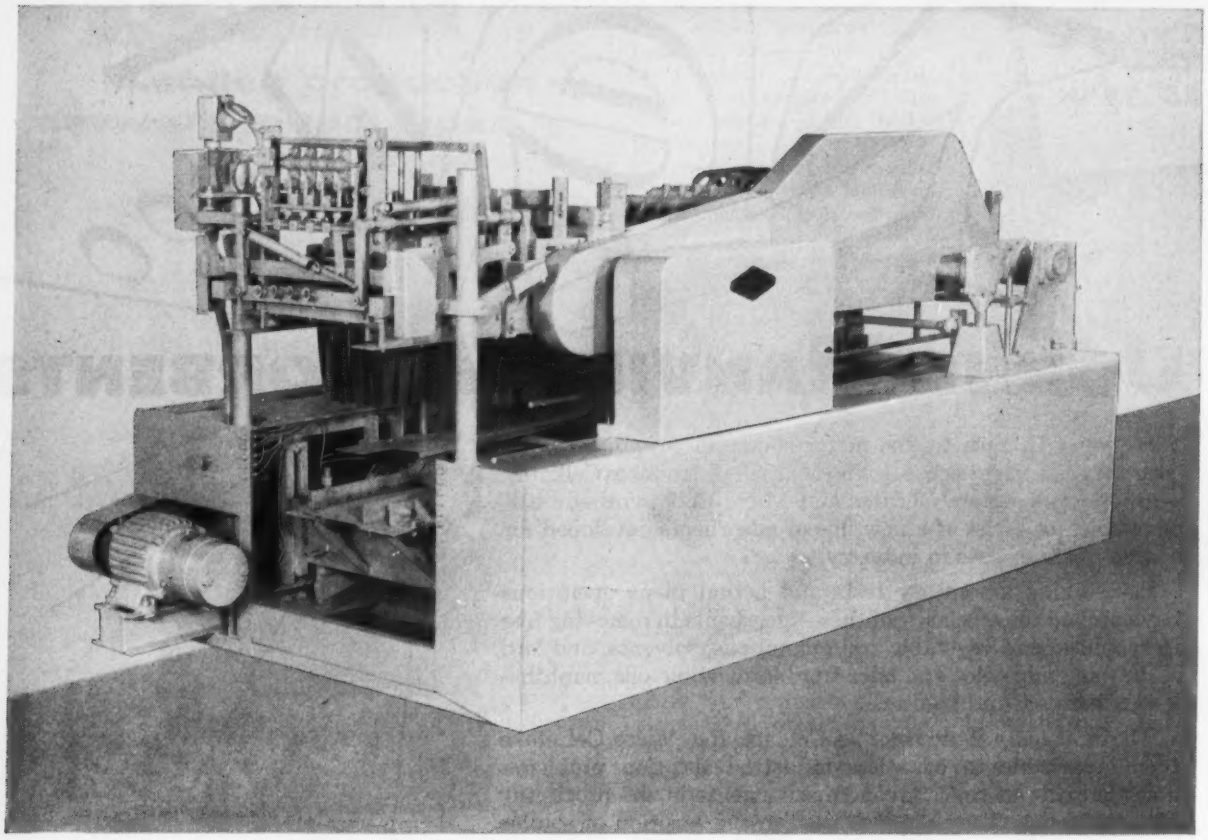
Address_____

City_____ Zone_____ State_____

☐ Have a Johns-Manville Celite engineer contact me.

6994 on Reader Service Slip.

# NEW!... from ATKRON DUMORE



## Continuous Motion Case Packer

**Interchangeable heads pack all bottles or cans in single or multiple layer cases!**

- FAST—Packs up to 30 cases per minute
- NO COMPRESSED air required
- POSITIVE PACKING CONTROL — Any irregularity in supply of bottles, cans or cases automatically delays packing drop until corrected by machine itself or operator
- SIMPLE OPERATION—Requires only casual attention of one man
- COMPACT — Small space requirements compared to machine capacity . . . 4' 9½" by 10' 4" in conveyor layout
- ELIMINATES bottle or label scuffing
- EASY CHANGEOVER for different bottles or cans (sizes and packs) can be accomplished in only 20 minutes
- ADAPTABLE TO PLANT LAYOUT—Fits all standard conveyors at standard conveyor heights
- LOW INITIAL COST and minimum maintenance

**to cut your new can handling costs . . .**

**ATKRON DUMORE AUTOMATIC CAN SORTERS AND UNCASERS**

. . . Automatically uncase, align and orient new cans ready for filling
. . . Adaptable for cans received in reshipper cartons, shipper trays, bags or bulk
. . . Speeds up to 1200 cans per minute with casual attention of only one man
. . . Models to handle all standard cans—6 oz. to 5 quart; cone top, screw cap and pressurized cans; rectangular, square and most specialty can styles.

Check other ATKRON DUMORE Equipment: Full depth and half depth Uncasers and Four Flap Case Openers. Write for complete information . . . it can easily make the difference between profit and loss in your plant.

**ATKRON DUMORE**

MANUFACTURED BY ATKRON, INC., CUYAHOGA FALLS, OHIO

Distributed and Serviced exclusively by GEO. J. MEYER MANUFACTURING CO. MILWAUKEE, WIS.

and ECONOMIC MACHINERY CO. WORCESTER 3, MASS.
Division of Geo. J. Meyer Manufacturing Co.

AT-1059-143

6995 on Reader Service Slip.


*packaging*

### Plastic packaging suppliers directory

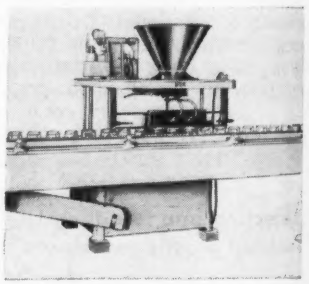
Thirty-six pg Directory of Plastic Packaging Suppliers lists both custom and proprietary plastics packaging molders and extruders in the US, in alphabetical order.

Information listed under each company name includes description of type of service it is equipped to provide, and names of officers of each company.

("Directory of Plastic Packaging Suppliers" is available from Koppers Company, Inc., Plastics Division, Koppers Bldg., Pittsburgh 19, Pa.)
6996 on Reader Service Slip.

### Fills beef stew, mashed potatoes or gravy into glass, foil, tin or poly

**Uses-Features:** New two-cylinder non-stop piston filler completely eliminates surge, starting and stopping of containers, while accommodating any liquid or semi-liquid product into containers with openings of 28 mm or larger.



Once cycle is completed, heads automatically return to next two containers in the line

Containers move continuously, with filling heads moving right with containers during filling cycle.

**Description:** Rate of fill depends on product and on interval between containers conveyed on space-lug chain.

Mashed potatoes may be filled at rate of 70 3½- to 4-oz frozen-dinner trays per min, using a 10-in. space interval. In this case, twin filling head moves 12½ in.

Beef stew may be filled at

up to 60 pints per min, with five-in. lug spacing, and use of cut-off valve.

Unit's contact parts are of nickel alloy or stainless steel. A manifold feed can be substituted for the reservoir; if desired, an agitator can be inserted into the reservoir.

Special-size cylinders and pistons are available to accommodate any size capacity.

(Two-cylinder non-stop piston filler is development of Elgin Manufacturing Company, 200 Brook St., Elgin, Illinois.)
6997 on Reader Service Slip.

### Presents latest facts on heat sealing polyethylene

Up-dated and expanded edition of brochure published in 1957 contains latest information and technology on heat-sealing — one of basic processes involved in package fabrication and closing — as developed in recent comprehensive series of laboratory tests.

Such machinery influences as clamp time, sealing-bar temperature and sealing-bar pressure are considered. Influences of resin density, melt index and slip are well defined.

In addition, such film factors as gauge, bag style (gusseted or not), treatment for printing, film-making process (blown vs. cast) and sealing direction (machine vs. transverse) are taken into account.

Finds of the tests appear in a series of 38 charts, all clearly explained and presented.

("Heat Seal Characteristics of Polyethylene Films and Coated Substrates," Second Edition, 16 pp, is available from U.S. Industrial Chemicals Company, Division of National Distillers and Chemical Corp., 99 Park Ave., New York 16, New York.)
6998 on Reader Service Slip.

**New Products & Packages pages 8-9**

# New Data on Aluminum Foil Packaging for Frozen Foods

***Report No. 25 of a Series by Reynolds Metals Co.***

The advantages of aluminum foil packaging in maintaining the temperature of frozen foods have long been recognized. Phases of the subject were presented in two previous reports of this Series. Report No. 9 dealt with packaged ice cream, with and without aluminum foil overwraps, in display freezers. In the vulnerable upper layers, temperatures of the foil-wrapped product averaged 9° less than for the ice cream without foil. Report No. 17 compared speed of freezing and extent of dehydration in variously packaged green peas in an air-circulated freezing compartment at −10°F. Results showed foil-wrapped peas reaching 0°F. in about half the time required for non-foil-wrapped peas—and dehydration, as measured by cavity ice, significantly less.

### Added Importance for Foil

Currently, aluminum foil packaging for frozen foods takes on added importance in view of the recommendations of the Association of Food and Drug Officials of the United States to establish a national maximum-temperature code.

It is in the light of this development that the Packaging Research Division of Reynolds Metals Company sought — and here presents — additional data specifically on the moderation of temperature rise in the contents of open display freezers.

### Tests Use Frozen Vegetables

The new research compared packages of frozen whole broccoli overwrapped with printed Reyseal (Reynolds foil-wax-tissue heat sealing lamination), and the same packages overwrapped with printed wax paper (33 lbs. per ream coated bright finished paper overwaxed with approximately 14 lbs. of wax per ream). Thermocouple leads were introduced to the center of the test packages, then the packages were stacked in an open display freezer—stacked six high in center front position with other packages at the sides and behind. Thermocouple readings were recorded at the peak of the defrost cycle (once in 24 hours) and after temperature had dropped to equilibrium conditions. The freezer was set to maintain −20°F. As the tables show, the top foil packages averaged 12.4° colder during the freezing cycle and 8.6° colder at the peak of the defrost cycle. For the lower packages in the stacks, the foil packages averaged approximately 2.5° colder during both cycles.

### Analyses of the Tables

Variance analyses of the test data show that the average differences in temperatures between foil-wrapped and wax-paper-wrapped packages are highly significant statistically. There is less than 1 chance in 100 of such differences occurring by chance.

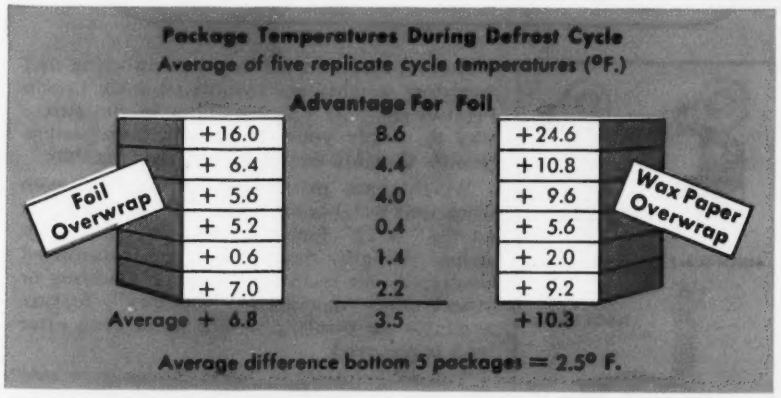
Analysis also shows that all or nearly all of the observed differences are attributable particularly to the top packages, which are exposed to the maximum effect of external (radiant) heat sources.

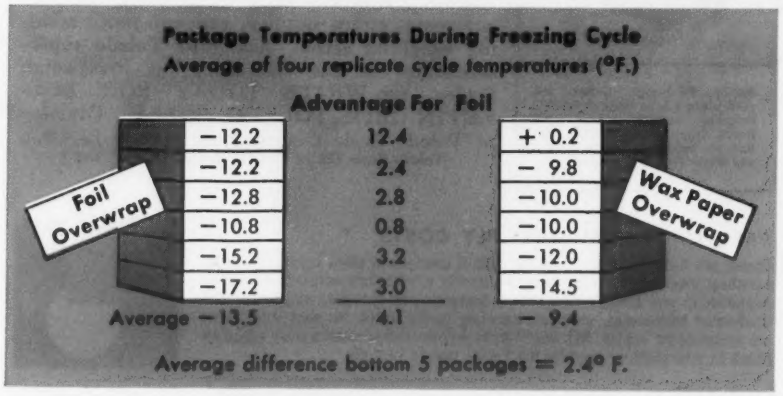
### Two-Way Effectiveness

These results tend further to confirm that both the radiant heat reflectivity and the high thermal conductivity of aluminum foil are involved in its effectiveness in moderating temperature rise. Less radiant heat reaches the contents when packages are foil-wrapped. And absorbed heat is more rapidly conducted by foil — to be dissipated in the lower part of the stack by contact with refrigerated air and colder surfaces.

### Now More than Ever

The AFDOUS "zero temperature" code proposal re-emphasizes the importance of temperature reduction and therefore the value of aluminum foil protection for frozen foods. The advantages of this protection include both maintenance of product quality through temperature rise moderation and also economies in freezer cabinet operation. For further information, please call your local Reynolds representative. Or write to **Reynolds Metals Company,** Richmond 18, Virginia.



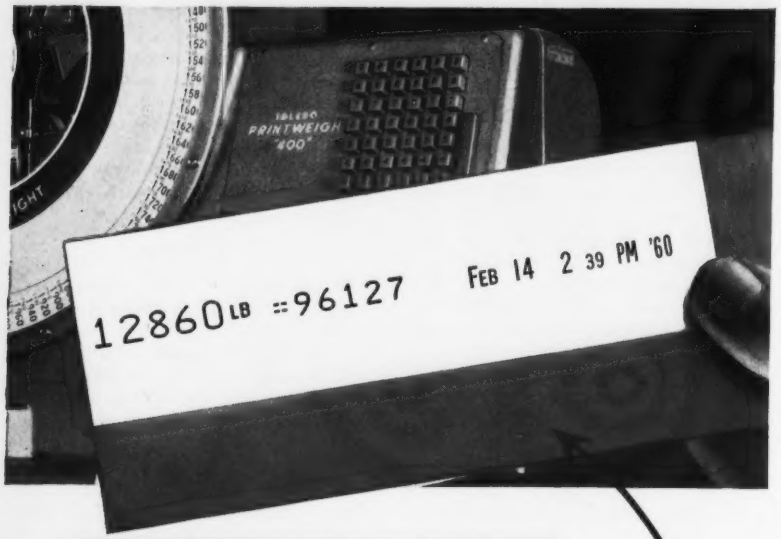




© 1960 by Reynolds Metals Company

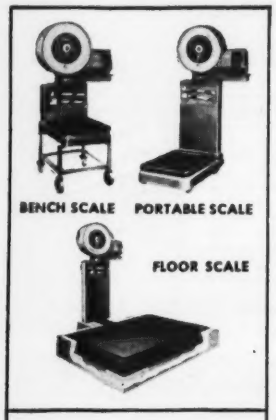
See these Reynolds shows on ABC-TV Network: "BOURBON STREET BEAT" and James Michener's "ADVENTURES IN PARADISE" Monday Nights.

6999 on Reader Service Slip.

# TOLEDO SCALES that PRINT Complete Weight Records for You . . .




**. . . THE ANSWER to prevent "guesswork" and errors in cost control!**




Toledo Printweigh Scales are available in a wide range of models, including Portable, Floor, and Bench types as illustrated; also Built-in, Hopper, Overhead Track and Motor Truck types.

Human errors in reading, remembering and recording weights are eliminated with Toledo Printweigh "400" Scales. They're the surest way to satisfy your requirements for weight records that are complete and indisputable.

Weights are printed in full figures, even when unit weights are used. Choice of printing on 8½" x 11" forms, or on tickets; also on strips. Weight data may be transmitted electrically for recording on remote adding or other office machines. "Memory" feature available for printing weight data, even after load is removed.

Toledo Printweigh "400" Scales give new flexibility and efficiency in weighing . . . to cut costs, guard quality, prevent profit-stealing weighing errors. Ask your Toledo representative for the full story on Printweigh Scales, or WRITE TODAY FOR BULLETIN 2017. TOLEDO SCALE, Division of Toledo Scale Corporation, Toledo 12, Ohio
(Toledo Scale Co. of Canada, Ltd., Windsor, Ont.)

**"MISFIT" SCALES MULTIPLY COSTS**

Scales can become "misfits" as a result of changes in plant layout, materials handling, inventory controls, value or quantity of materials weighed. If this has happened in your plant, the results can be costly. For example: weighing errors, production bottlenecks, materials handling inefficiencies. Be sure your scales are adequate for the job. Ask your Toledo representative about a scale adequacy check in your plant, or send for the Toledo Weight Fact Kit.

SERVICE

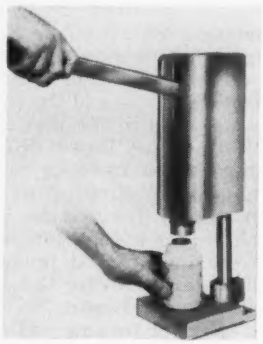
**TOLEDO®** *Headquarters for Weighing Systems*

7000 on Reader Service Slip.


*packaging*

### Faster hand crimping of aerosol cans

**Features:** Single-stroke lever system is so designed that a short stroke affords multiplied leverage. Comfortable lever position adds greatly to ease of operation. Operator fatigue is so reduced that unit is ideal for small lot production as well as laboratory work.



All moving parts are enclosed, for operator safety

**Description:** Keyway-guided head maintains central position of crimping jaws throughout all changes of container height. Bolt-down holes in base allow attachment on production line or laboratory bench. Crimper weighs only 35 lb.

(Amco Hand Crimper is manufactured by Aerosol Machinery Co., 80 Magnolia Ave., Westbury, L.I., N.Y.)
7001 on Reader Service Slip.

### Fragrant poly packaging makes good scents

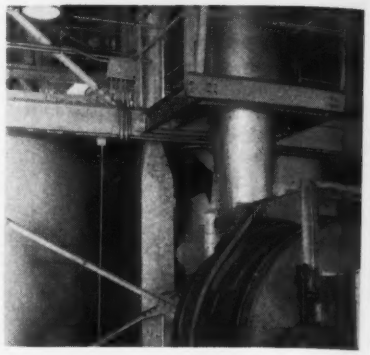
A "new dimension" added to polyethylene packaging films and molded items — aroma — is expected to stimulate sales still further for items packaged in polyethylene.

Among wide variety of scents already developed are chocolate and spearmint for candy box overwrapping, and "cookie" for overwrapping cookie and cracker boxes. Other "flavors" such as orange, potato, lemon, lime, straw-

(*Continued on page* 80)


**Problem:**

**To reduce cost of blending 200 dry powder formulas from 52 raw materials**



**Solution:**

**SPROUT-WALDRON PNEUMATIC SYSTEM**

Pushbutton blending of over 200 different dry powder formulas, from 52 raw materials at Dearborn Chemical Company is credited with a 1300% increase in manpower efficiency. 98,000,000 lbs. a year of diverse formulas for water conditioning and corrosion control can now be turned out by sixteen operating and maintenence personnel at the Dearborn plant. This rate of 6,125,000 lbs. per man per year is contrasted with the rate of 438,500 lbs. per man per year at their old plant.

Credit for this tremendous increase in efficiency goes to the speed and automation of the Sprout-Waldron pneumatic handling system. This air transfer system handles the dry chemicals at rates to 80,000 lbs. per hour over a 25 ft. horizontal run and a 69 ft. lift.

Sprout-Waldron positive and negative pressure systems are helping industry cut costs and speed handling. Further specific information can be found in Bulletins 118 and 208. Copies available on request.

CW/106

SW **SPROUT-WALDRON**
Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

7002 on Reader Service Slip.

## Association News

### Harvard School of Public Health

Boston, has been pledged $100,000 a year for ten years by General Foods Corp. for the construction of a laboratory unit. The laboratory, for nutritional studies in biology and medical sciences, will be housed in the top four stories of an 11-story building being built by the school partially with a $1,450,000 grant from the National Institutes of Health, U. S. Department of Health, Education and Welfare.

### Ward Baking Company

has purchased for cash the 71-year-old New England Bakery of Providence, R. I. The purchase includes a modern bakery facility and 72 routes throughout Southern New England.

### Packers Canning Corp.

Los Angeles, an affiliate of Kal Kan Foods, Inc., has appointed Gifford A. Cast vice president. Packers Canning is a large packer of edible canned meat and foodstuff for the US Government.

### National Dairy Council

Chicago, will support seven nutrition research projects, calling for grants-in-aid totaling $52,700, from its 1960 budget. Six projects are renewals of studies already in progress. One new study will measure effects of varying calcium intakes on calcium and strontium absorption, excretion and retention in normal people and in people with osteoporosis (loss of bone density), scoliosis (lateral curvature of the spinal column) and other possible metabolic bone diseases.

For more information on product at right, circle 7003 see information request blank opposite last page.

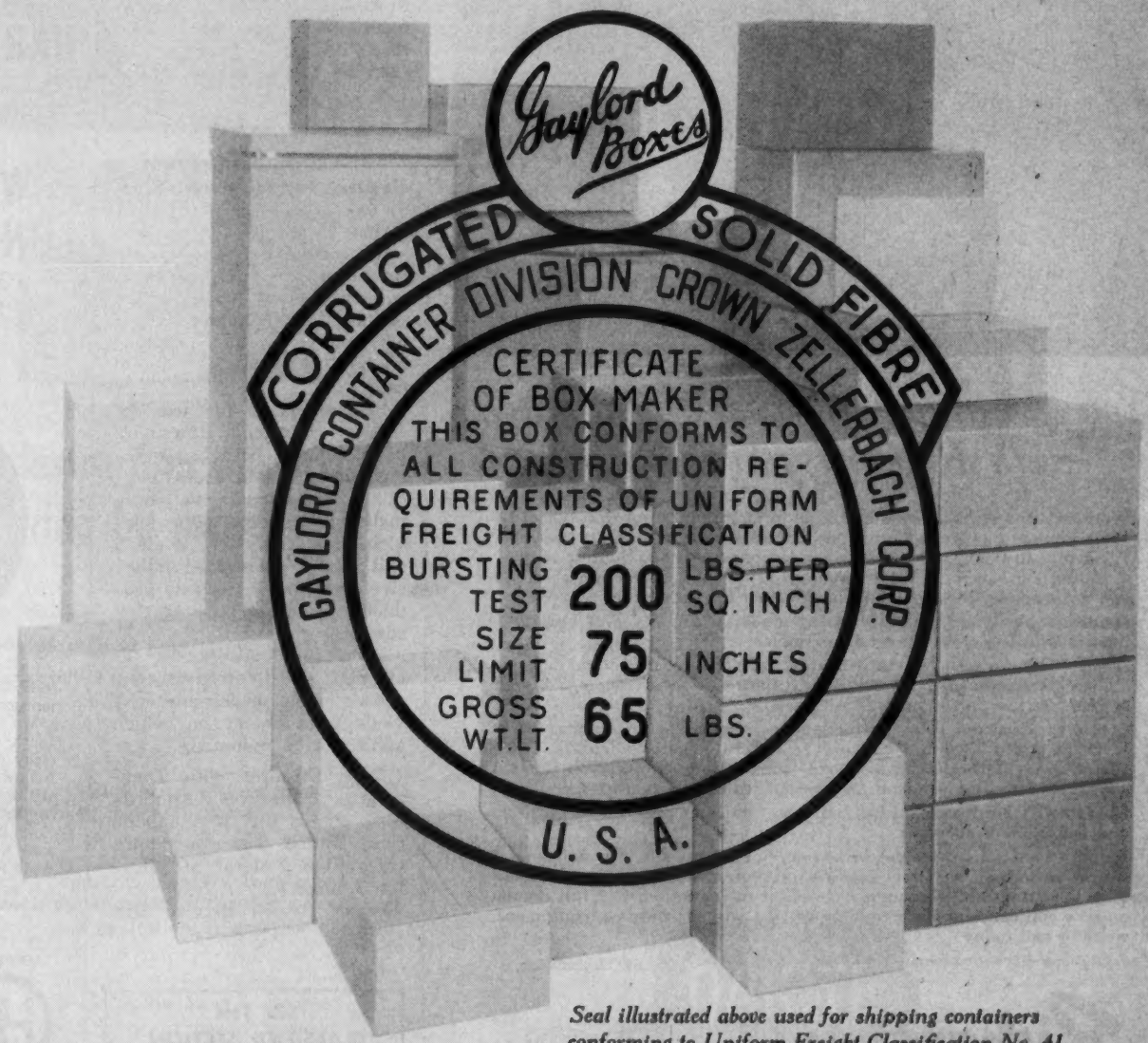

# *This is only one proof of* GAYLORD *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?




*Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.*

**CROWN ZELLERBACH CORPORATION**
**GAYLORD CONTAINER DIVISION**

IN CANADA · CROWN ZELLERBACH CANADA, LTD. VANCOUVER, B. C.

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

(*Continued from page 78*)
berry, raspberry and even onion, for produce packaging, also will be available pending FDA approval.

All aromas become an integral part of the polyethylene film — they cannot be washed away.

(Scented polyethylene film — made from "Petrothene" film grade resin supplied by U.S. Industrial Chemicals Co., and "flavored" by "Poly-Scent" resin concentrate, developed and supplied by Fragrance Process Co., Inc. — is manufactured by Texas Plastics Inc., Elsa, Texas.)
7005 on Reader Service Slip.

### Moistureproof, sift-proof closures for multiwalls

How a new hot-melt adhesive system produces moistureproof and sift-proof closures on multiwall bags is explained in new folder, which also illustrates and provides specifications on the applicator.

Recommended for use on existing bag end closure equipment in both bag-making plants and in users' bag-filling operations, new hot-melt system reportedly provides cost reduction, a clean and easily maintained adhesive system, increased production rates and better closures.

Processing speeds, it is claimed, are limited only by speeds of the sewing and conveying equipment on which applicator is mounted.

("Tape Closures with Thermogrip Adhesives Applicators," four pp, is available from United Shoe Machinery Corp., 140 Federal St., Boston 7, Mass.)
7006 on Reader Service Slip.

*You can automate from bin to batch with Richardson equipment*

Whether your requirements are large or small, a Richardson Select-O-Weigh automatic proportioning system offers you the advantages of – **1.** Savings in labor costs. **2.** Increased productivity. **3.** Quality control. **4.** Better housekeeping. **5.** Permanent printed records. Incorporated into and governed by a Select-O-Weigh System are such units as –

**Feeders** – Designed to handle your material quickly and quietly – hundreds in use on all kinds of products.

**Scales** – Richardson Automatic Scales are known for speed and dependability. Any number can be remotely controlled by a Select-O-Weigh system.

**Controls** – Program your production and processes by punched card, formula board, formula capsule or weight-selector verniers. Only Richardson offers all four. Control is from a single electronic panel board, operated by one man. No special training is required.

**Readout**–Richardson furnishes counters, totalizers, printers, typewriters and recorders of all types.

Richardson's nationwide network of service facilities is at your disposal within 24 hours if required. Likewise, Richardson helps you at start-up of your system and thoroughly checks it in operation. For full details on how you can automate your processing with Richardson equipment, write or call today. 1791

Richardson Scales conform to U.S. Weights and Measures H-44 for your protection.

*Here's the answer . . .*

Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902

**RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY**
**Sales and Service Branches in Principal Cities • Also manufactured in Europe to U.S. Standards.**

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**SEE THE CLASSIFIED SECTION**
Equipment — Materials — Employment — Business Opportunities—Professional and Technical Services
**Page 124**



**HOLZ Vulco-Lagged PULLEYS**

GRIP BETTER TO KEEP TRACTION.. UP UP
DRIVE HARDER TO KEEP PRODUCTION.. UP UP UP UP
WEAR LONGER TO KEEP PROFITS.. UP UP UP UP

**HOLZ Vulco-Lagged PULLEYS** step up performance and eliminate seasonal maintenance to save you dollars and downtime! Tough, abrasion-resistant lagging of specially compounded rubber is permanently bonded to metal pulleys for positive, non-slip driving. Pulleys run longer without relagging*; belts run longer without renewing! Have lagging applied to **your** pulleys, or order **HOLZ Vulco-Lagged Pulleys** complete. Write for detailed information today.

*Up to 10 years operation reported on HOLZ Pulleys.

"IF IT'S RUBBER, WE CAN MAKE IT!"
SERVING INDUSTRY FOR A QUARTER CENTURY

HR **HOLZ RUBBER COMPANY, INC.**
1133 SOUTH SACRAMENTO STREET
LODI, CALIFORNIA
Dealer inquiries solicited.

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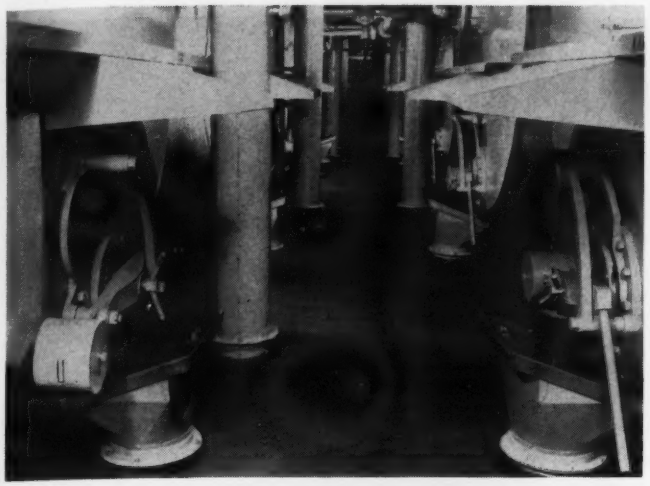

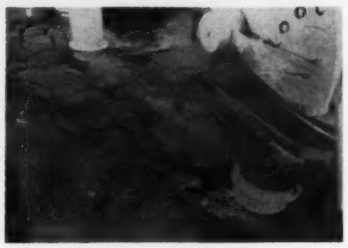

Photo at right shows how sugar enzymes from corn pulp caused major damage to concrete flooring in plant of leading Midwest food processor. Above photo shows new cement flooring after two-year test installation in corn grinding area. Inspection after test showed no floor damage.

# Eliminates destruction of concrete flooring by sugar

**Two-year test with special cement, used to cover floors of Midwest food processor, show flooring in perfect condition**

**PROBLEM:** For years, concrete floors in the many plants of a leading Midwest food processor had been eroded and cracked by enzymes and sugar solutions occurring in the conversion of cornstarch to sugar.

Despite all precautions, leakage, spillage and air-borne particles brought the damaging enzymes into contact with the floor. As a result, pits and cracks developed throughout the building, making sanitation difficult, increasing maintenance costs and creating safety hazards.

**Solution:** A special cement, developed for outside decks on ocean liners and subsequently used as flooring in industrial plants, was called to the attention of the firm's food and sanitation engineers.

While it was well known that the cement, having neoprene as its basic ingredient, was resistant to aging, wear, chemicals, oils and moisture, plant engineers wanted to make conclusive tests before adopting the material for plant-wide applications.

A test installation was made

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

**Cleaning in-place cuts downtime from a week to an hour for canner**

IN-PLACE CLEANING with modern Oakite materials produces truly remarkable results. For example:

Juice lines at one packing plant had become so caked with grape juice residue that black specks appeared in lighter colored runs. Half of the lines were dismantled and several men spent *a week* cleaning them manually.

Then the Oakite man urged in-place cleaning of the remaining half of the lines. A heated Oakite solution was circulated for 35 minutes through the pipes, which were then flushed. Results: *100% clean*—all in less than an hour.

**The big PLUS in Oakite**

Working with Oakite brings you the latest information on mechanized cleaning methods, on products that do the job. It means an end to waste of time and materials. It provides the advantages of constant cleaning research . . . a wealth of experience . . . *guaranteed* performance.

Ask your local Oakite man to demonstrate in your own plant, or send for Bulletin F-9414, which gives details. Oakite Products, Inc., 26G Rector St., New York 6, N. Y.

OAKITE SCIENCE

over 50 Est. 1909 years' leadership in industrial cleaning

7008 on Reader Service Slip.

in 1955 in one part of the corn grinding section. The flooring covered was in an advanced state of deterioration with countless cracks, voids and crumbling areas.

First, pools of sugar solution were cleaned from floor surfaces. Areas were then scrubbed with chemical solutions. Loosened concrete was chipped down to a firm surface and cracks and voids were filled with a special undercoating. Following this, a quarter-inch layer of the new cement was applied by trowel.

**Results:** After two years service, test application was inspected and found to be in perfect condition in every respect. It was, therefore, decided to install the same floors in other areas.

The flooring is non-slip, wet or dry, contributing greatly to in-plant safety. Lasting resilience of neoprene gives flooring sufficient flexibility to eliminate cracking — even above cracks in the concrete sub-surface.

Absence of odors is evidence that waterproof qualities of the high performance cement prevent sugar-laden solutions from penetrating into the floor.

100,000 square feet of the material has been installed in processor's plants, with considerable additional installations planned.

(Neoprene, basic ingredient of the new cement, is a product of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. "Dex-O-Tex" Neotex cement is a product of Crossfield Products Corporation, 140 Valley Rd., Roselle Park, N.J.) 7009 on Reader Service Slip.

DOW | INSULATION

### Anti-friction lubricants have no melting or dropping point

**Uses-Features:** Two anti-friction lubricating compositions, having no melting or dropping point, provide constant protection to roller, ball, sleeve bearings, and sliding surfaces in "hot" bearing applications or in areas with ambient heat.

Repeated blow torch tests

# THIS MAN KNOWS STYROFOAM®

## AND LOW-TEMPERATURE INSTALLATION, TOO

HE'S AN APPROVED INSULATION CONTRACTOR, typical of the special group of low-temperature insulation contractors that Dow has selected for their outstanding experience and abilities in installing Styrofoam*. Each Approved Insulation Contractor listed below has a reputation for top-quality workmanship. All 77 of these firms are thoroughly familiar with Dow recommendations for installing Styrofoam, and they are committed to follow these recommendations on every job.

Consult an Approved Insulation Contractor when you're planning your next freezer or cooler room. The superior *insulating* performance of Styrofoam, teamed with the superior *installing* performance of an Approved Insulation Contractor, is your assurance of a top-quality job.

*DOW'S TRADEMARK FOR ITS EXPANDED POLYSTYRENE.

### SAVE THIS LIST FOR REFERENCE

**For the best low-temperature installation, get in touch with the Approved Insulation Contractor near you.**

**ALABAMA**
**Birmingham**
Badham Insulation Company, Inc.

**ARIZONA**
**Phoenix**
Barrett & Homes
**Tucson**
Arizona Insulation Company, Inc.

**ARKANSAS**
**Little Rock**
J. C. Lewis Company

**CALIFORNIA**
**Fresno**
Fiberglas Eng. & Supply Div.
**Los Angeles**
Armstrong Contracting & Supply
Fiberglas Engineering & Supply Co.
Los Angeles Cork Company, Inc.
Los Angeles Ind. Bldg. Materials, Inc.
**North Sacramento**
Fiberglas Engineering & Supply Div.
**San Francisco**
Fiberglas Engineering & Supply Div.
Peterson-Cobby Insulation, Inc.

**CONNECTICUT**
**Bloomfield**
W. L. Walker Company

**COLORADO**
**Golden**
Denver Lining Company

**FLORIDA**
**Haines City**
R & S Insulation Company
**Jacksonville**
Insulation Contractors
**Miami**
L. L. Jackson, Inc.
**Tampa**
Gulf Coast Insulation Company, Inc.

**GEORGIA**
**Atlanta**
Asbestos Insulation Company, Inc.

**INDIANA**
**Indianapolis**
Indiana Asbestos Company, Inc.

**ILLINOIS**
**Chicago**
Cork Insulating Company, Inc.
**East Moline**
Low-Temp Insulations
**Schiller Park**
Albert H. Bromann, Jr., Inc.

**KANSAS**
**Kansas City**
Mid-Continent Ind. Insulation, Inc.
Preston Refrigeration Company

**KENTUCKY**
**Louisville**
Cardinal Industrial Insulation, Inc.

**LOUISIANA**
**New Orleans**
McCarty-Branton
**Shreveport**
Taylor Contracting & Supply Co.

**MAINE**
**Lewiston**
Northeastern, Inc.

**MARYLAND**
**Baltimore**
F. V. Vleck Company
**Cheverly**
Frank Heintze Company, Inc.

**MASSACHUSETTS**
**Walpole**
Allied Cork, Inc.

**MICHIGAN**
**Detroit**
Chrysler Koppin Company, Inc.
**Grand Rapids**
Tony Batenburg Insulation Co.

**MINNESOTA**
**Minneapolis**
General Adhesives Products Co.
Hauenstein & Burmeister, Inc.
Insulation Sales Company, Inc.

**MISSOURI**
**St. Louis**
Young Sales Corporation

**NEBRASKA**
**Omaha**
Low-Temp Insulations

**NEW YORK**
**Albany**
Cork Insulation Contracting Co.
**Buffalo**
The Jewett Refrigerator Co., Inc.
**Forest Hills**
Charles M. Trojahn
**New York**
Eastern Cold Storage Insul. Co., Inc.
Globe Cork Insulation Company
Martin & William Smith
**Syracuse**
The Knudsen Company
**Utica**
George Weisenberger Company

**NORTH CAROLINA**
**Asheville**
Bonitz Insulation Company of Carolina-Tennessee, Inc.
**Goldsboro**
Bonitz Insulation of Eastern Carolina, Inc.
**Greensboro**
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**OHIO**
**Cleveland**
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**VIRGINIA**
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**Manitowoc**
Northwestern Asbestos & Cork Insulation Company, Inc.

**THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN**

*See "The Dow Hour of Great Mysteries" on NBC-TV*

7010 on Reader Service Slip.


have proven that even after being exposed to intense heat of blow torch, compositions will burn, but not melt or drop.

In addition, lubricants are moisture resistance, will not wash out, have high chemical stability, heavy molecular structure with exceptional metal adherence properties and temperature reducing qualities.

**Description:** Anti-friction compositions are available in two grades. No. 1 grade has light density and is recommended for high speed temperature applications.

Composition No. 2, with its heavier density, is for low speed, high temperature applications, or loosely-fitting bearings.

Both compositions are available in 14½ ounce cartridges for application with lever-type cartridge guns. They are also available in regular bulk containers for use with automatic systems, grease cups, pressure systems or grease guns.

(A free trial sample 14½ ounce cartridge — specify Anti-Friction Composition No. 1 or No. 2 — is available from The Whitmore Mfg. Co., 3816 Iron Court, Cleveland 4, Ohio.)
7011 on Reader Service Slip.

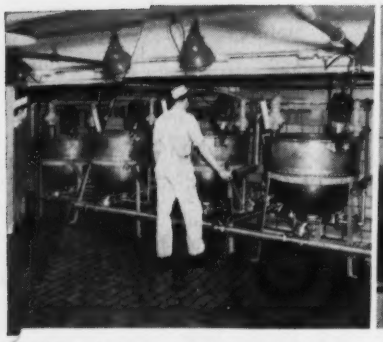
### Automatic chemical control for cooling towers and evaporative condensers

Unit which automatically feeds balanced chemical treatment into water circulating system of cooling towers or evaporative condensers in described and illustrated in 6-page, fold-out brochure.

Chemical control unit will remove old scale, prevent formation of new scale, reduce corrosion to a minimum and kill slimes and algae, as well as prevent their further growth. System requires no weighing or mixing of chemicals, no handling of acids, no noxious odors to endure and eliminates hazardous climbs to dump chemicals into cooling towers.

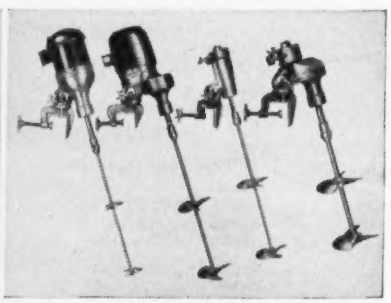
## How to choose a portable mixer

*To get your money's worth, ask yourself these questions . . .*



**1. Will it mix my materials efficiently?** Your mixer must set up just the right *balance* of fluid flow and turbulence for the result you want. You get this balance with a LIGHTNIN Portable Mixer. Selected by scientific methods, it's *guaranteed* to do the job right.

**2. How is the shaft supported?** Is the mixer built to protect the motor against the strain of radial shaft loads? You'll find this vital safeguard in LIGHTNIN Mixers. An extra ball bearing here steadies the shaft for true running—adds years to motor life.



**3. What about adjustability?** You can quickly swing a LIGHTNIN Portable to any angle for the exact kind of mixing you want—slow roll, vortex, or rapid top-to-bottom turnover. Universal ball-and-socket clamp tightens without wrenches—stays tight.

**4. How much choice do I have?** With LIGHTNIN Portables you can choose from *thirty* models, ⅛ to 3 HP. Direct or gear drive; electric or air motor. Shafts and propellers in all alloys and coverings. There's a LIGHTNIN Mixer to handle any job.

**5. Where can I get prompt service on fluid mixing?** Just call your LIGHTNIN Mixer representative. He can quickly give you a guaranteed recommendation. And he's near you—look him up in Thomas' Register or the yellow section of your telephone directory. Or write us direct.

LIGHTNIN®
MIXERS AND AGITATORS
MIXCO
Fluid Mixing Specialists

**MIXING EQUIPMENT Co., Inc., 132-d Mt. Read Blvd., Rochester 3, N.Y.**

*In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.*

7012 on Reader Service Slip.


*sanitation*

No moving parts are used, although unit feeds proper chemicals in precise amounts silently and automatically.

System consists of a small, lightweight, closed reservoir mounted on the side of the cooling tower or evaporative condenser. A portion of the recirculating water from the cooling tower or evaporative condenser flows through this reservoir.

A sleeve, mounted on top of the reservoir, holds a weather-sealed plastic tube containing a sequence of variously formulated compressed chemical briquettes.

These briquettes are custom-formulated and are packaged in many different combinations to combat practically every known water problem of any geographical area.

As the briquettes are gravity-fed into water flowing through the reservoir, they slowly dissolve and are carried into the entire system.

Chemicals are fed only when recirculating pump of cooling tower or evaporative condenser is in operation. Thus, they are fed only when needed at a pre-determined rate required for positive control.

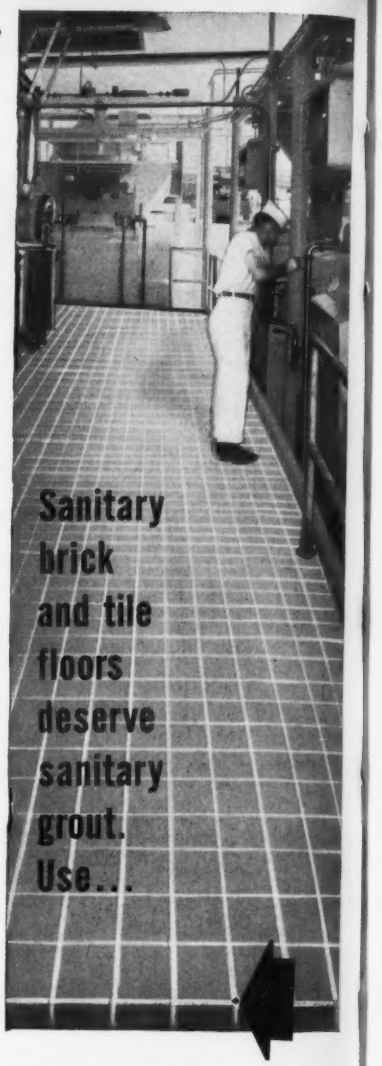
(Bulletin on "Chemicator — A New Concept in Water Control" is available from Erlen Products Company, Burbank, Calif.)
7013 on Reader Service Slip.

### 6 times stronger than concrete

A highly adhesive, epoxy-type floor patching and resurfacing compound has an impact and abrasion resistance five to six times as great as concrete. Because of its strong adhesive characteristics and high strength, compound may be applied in layers as thin as ⅛".

Compound eliminates the need for chipping, jack-hammering and time consuming preparations normally required with concrete floor repair work.

It protects against most industrial acids, alkalies and solvents which are very de-


**HYDROMENT**
**JOINT FILLER**

HYDROMENT JOINT FILLER improves new or old tile floors three ways: provides permanently tight joints; greatly increases resistance to the corrosive action of alkalies and bacteria; inhibits development of food acids. Non-toxic and odorless, HYDROMENT JOINT FILLER requires little maintenance. Available in most wanted colors. Write for catalog.

UPCO
Pioneers in Industrial Research Since 1881
THE UPCO CO.
4805 Lexington Ave. Cleveland 3, Ohio

7014 on Reader Service Slip.

structive to concrete floors. It is also quick-setting, permitting floors to be used after over-night curing.

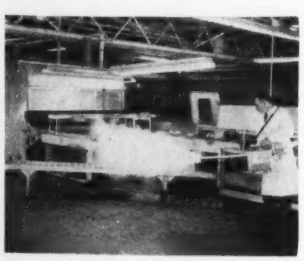
Basically, the compound consists of a blend of epoxy resins, selected mineral aggregate, a catalyst and color. When combined, a true chemical reaction takes place — not merely the oxidizing or evaporation of solvents. Since formulation is composed of one hundred percent solids, there is no shrinking of patch or topping. Compound is available in gray, red or green.

(RIW Epo-Tox patching and surfacing compounds is a development of Toch Brothers, 2600 Richmond Terrace, Staten Island, New York.)
7015 on Reader Service Slip.

**Covers greater areas with less insecticide**

Insecticide fog generator produces a dense cloud of dry insecticide fog without messy and dangerous residues. Unit utilizes low-volume application for insect control, requiring less insecticide formulation to cover greater areas.

Portable unit is 52 inches long and weighs only 16½ pounds. It is constructed of stainless steel and aluminum. Powered by regular grade gasoline and having only one moving part, maintenance is negligible.



Portable insecticide fog generator provides wide flexibility for varied applications

(Dyna-Fog "50" insecticide fog generator is manufactured by Curtis Automotive Devices, Inc., PO Box 297-7, Westfield, Indiana.)
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Which of these features do you look for in a FOOD OR BEVERAGE HOSE?

Freedom from Odors and Taste?
Ease of Cleaning and Sterilizing?
Transparency?
Flexibility?
Long Service Life?
Wide Range of Standard Sizes?

TYGON® plastic TUBING B44-3 combines them all!

Remaining flexible throughout the full range of normal operating temperatures, Tygon plastic Tubing, Formulation B44-3, is also as clear as glass, permitting visual inspection and control of flow.

Non-contaminating and non-toxic, Tygon Tubing B44-3 neither imparts nor absorbs taste or odors, is safe with even the most flavor-sensitive products.* Because of its smooth, hard bore, Tygon Tubing is easily cleaned, can be sterilized with steam (open end method) or bactericides.

Tygon Tubing is non-aging, highly resistant to abrasion, and has a flex life 10 to 12 times greater than rubber. More than 65 standard sizes, up to 4" I.D., are available in continuous lengths.

*For processed milk and milk products, use Formulation B44-4X.

See why Tygon Tubing, Formulation B44-3, is almost universally the preferred plastic for handling foods and beverages. Get complete information — write today for your free copy of Bulletin T-100.

443-F-3

PLASTICS & SYNTHETICS DIVISION | U. S. STONEWARE AKRON 9, OHIO

TYGON is a registered Trade Mark of The U. S. Stoneware Co.

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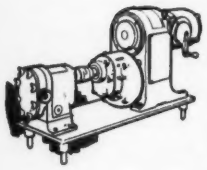
# VITAL DECISION

**selecting the pump for your product**

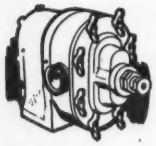
**You can be more selective with a WAUKESHA**

**POSITIVE DISPLACEMENT PUMP**

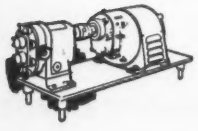
When you've been producing positive displacement pumps for nearly half a century, you learn a few things. Specifically: that no single pump can possibly perform in every stream . . . that the wisest economy you can practise is to place your initial investment in a pump engineered for your product.



With a Waukesha, you *can* be completely selective . . . with a pump engineered to give trouble-free flow, increased life span on the job and less costly down-time *in your specific product stream.* Waukesha offers more than 500 positive displacement pump combinations for capacities from 0 to 300 G.P.M., a choice of metal or rubber impellers, vertical or horizontal ports, in Stainless Steel or "Waukesha" metal (nickel alloy). Consultation with our research staff can determine which specific pump application is the 1 out of 500 for your product.



*NOW — Waukesha offers a complete line of sanitary fittings, valves and centrifugal pumps.*



WAUKESHA FOUNDRY COMPANY

**Waukesha, Wisconsin • Write Dept. 47**

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# *Quantitative Data on Difficulty of Driving Insects Out of Hiding*

**RUSSELL W. WHITING**
Entomologist
West Chemical Products, Inc.
Long Island City, New York

For many years, sub-lethal doses of Pyrethrum have been reported to be very irritating to cockroaches and other insects. It is widely believed that this irritation drives them from well-concealed hiding places, bringing them out in the open where they are more likely to receive a lethal concentration of insecticides.

It was decided that, if possible, it would be desirable to obtain some quantitative data on the irritating effects of Pyrethrum and synergized Pyrethrum sprays to measure their effective drive-out action. An investigation of available literaure revealed that most biological tests conducted with Pyrethrum were concerned with knockdown and mortality rather than irritation.

For this reason, laboratory tests were conducted with adult, male, German cockroaches to obtain a quantitative measure of the irritating effect of Pyrethrum, alone or in combination with various synergists.

Chemicals tested, alone and in combination with Pyrethrum, included base oil (Deobase), synergists Piperonyl Butoxide and MGK-264 and repellent R-11.

When used alone, base oil, the synergists, the repellent and a 0.1% concentration of Pyrethrum give little or no drive-out action at dosages of two ounces per 1000 cubic feet.

While the use of the synergist Piperonyl Butoxide is of some assistance in increasing effective drive-out action when used with low Pyrethrum levels, its effect is lost when used with higher levels of Pyrethrum.

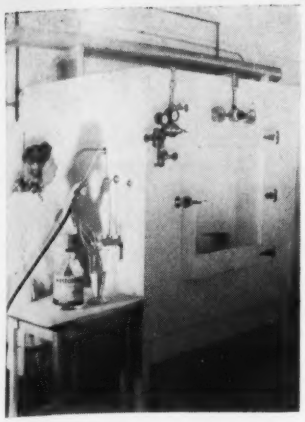
The addition of a second synergist to a combination of Pyrethrum and Piperonyl Butoxide does not increase drive-out action. Similarly, the addition of a repellent to combined Pyrethrum and Piperonyl Butoxide also has no effect in increasing drive-out action.

Best results were obtained with a concentration of 0.4% Pyrethrum used alone. This gives a drive-out action of 35 to 40%. Regardless of the amount of Piperonyl Butoxide added to the 0.4% Pyrethrum, drive-out action is not increased above the 35 to 40% mark, at a dosage equivalent to two ounces per 1000 cubic feet.

Thus, it is concluded that any irritation or drive-out action resulting from the use of Pyrethrum combined with synergists or a repellent is due to the Pyrethrum alone.

Although a high concentration of Pyrethrum displays the greatest drive-out action, it is evident from the results of the tests that many of the insects still remain in hiding to emerge at a later date.

Therefore, to obtain satisfactory insect control, it becomes necessary to use very frequent applications of Pyrethrum space sprays or a combination of these with residual insecticides.



View of vault (a chamber of 100 cubic feet) used to test the effectiveness of Pyrethrum alone and in combination with synergists and a repellent in driving insects out into the open.

Roaches were released into a metal container, 18" x 12" x 12", which was placed on the floor inside the test vault. Four inverted paper cups were placed in the container — one in each corner.

Two holes, approximately one inch square, were cut on the edge of each cup for entrance of any roaches seeking shelter. A third hole, ½ inch in diameter, was made in the top of each inverted cup so that sprays could drift inside.

Food and water were placed under each cup and two 100 watt light bulbs were placed approximately three feet above the test.

Fifty roaches, which were held overnight without food and water, were released into the metal containers. The same test was conducted five times so that a total of 250 cockroaches were used in the tests.

Roaches were allowed to remain unmolested for ½ hour after being released into the container. At the end of the half-hour period, the number in hiding were counted.

Test samples of Pyrethrum, alone and in combination with synergists and a repellent, were dispensed through an atomizing nozzle (as shown in above photo) to give a dry, fine mist. At three and five minute intervals after spraying, the number of roaches out in the open were counted to determine how many had been driven out following the spray.

Close results of three and five minute counts indicates that any activity takes place during the first three minutes after spraying.


# Steelcote FLOOR-NU

*The Modern Way to Restore Floors to a BETTER THAN NEW Surface*

**SPECIFICALLY RECOMMENDED FOR BREWERIES, TANK HOUSES, HOPS AND YEAST PLANTS.**

FLOOR-NU is Steelcote's newest contribution to better maintenance through quality coatings. It is a formulation of abrasion-resistant materials combined with chemically-resistant plastics that offers many advantages over ordinary resurfacing materials and methods.

**COMPLETE RESURFACER**—No solvents to add... no extra ingredients needed. FLOOR-NU is 100% solids.

**EASY TO APPLY**—No special tools or special skills needed. Trowel it on or, if you wish, application for large areas can be made faster with a stainless steel roller gauged for ⅛" coverage. This roller is available for rental from Steelcote.

**FASTER DRYING**—Sets up for foot traffic in 3 hours... for heavy duty traffic overnight at 70 degrees Fahrenheit.

**NO SHRINK**—Won't pull away from walls or cracks. It's flexible to compensate for expansion and contraction, yet it will not soften in heated work areas or crack under tremendous work loads.

## NO RISK TRIAL OFFER

BEFORE

**Send for 26-lb. Floor-Nu trial unit. Use half. If not satisfied, return balance prepaid. Credit for entire shipment will be issued.**

AFTER

STEELCOTE MFG. CO., ST. LOUIS 3, MO. • Rodney, Ontario, Canada

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# POWELL
# giant in-stock valve supply for quick delivery

Powell maintains one of the largest in-stock supplies of bronze, iron, steel and corrosion resistant alloy valves in the world. So you can receive immediate valve delivery from Powell's factories or your nearby distributor's stocks and avoid costly operational delays or plant shutdowns.

For quick action, just pick up your phone and contact your local Powell Valve distributor or The Wm. Powell Company direct. With our 114 years of valve manufacturing experience, we can fill your valve needs and solve your valve problems! Let us hear from YOU—TODAY!

THE WM. POWELL COMPANY DEPENDABLE VALVES SINCE 1846 CINCINNATI 22, OHIO **world's largest family of valves**

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## Plants, Companies, Personalities

### Carnation Company

has elected Mark A. Matthews to vice president in charge of the firm's Fresh Milk and Ice Cream division. He succeeds William Backstrom, retired.

### Scudder Food Products, Inc.

Los Angeles, has purchased Good Foods, Inc. and Cal-Snax, Inc., both of Los Angeles, and Golden State Potato Chip Company of Long Beach, Calif. Scudder also has broken ground for its new, ultra-modern and large-capacity plant in Anaheim, Calif.

### Gebhardt Chili Powder Company,

San Antonio, Texas, a division of Beatrice Foods Company since December 15, 1959, has as new executive vice president and general manager Wil-

liam P. McCarthy, promoted from general sales manager of LaChoy Food Products, Archbold, Ohio, also part of the Beatrice organization.

### Aunt Nellies Foods, Inc.

Clyman, Wis., has purchased the two-story, 34,000-sq-ft Carnation Company plant located in nearby Watertown, Wis. Plant will be used to expand production of Aunt Nellies' convenience and ready-prepared specialty foods.

### Drake Bakeries Incorporated

New York, N. Y. has elected as president Theodore G. Montague, Jr., executive vice president. He succeeds Leo. W. Bayles, who has asked to be relieved of his responsibilities, but who will continue as a director, and, until his normal retirement in mid-1960, as a consultant.

# New Techniques In Equipment Cleaning:

# KLENZADE SANITATION PROGRAMS

**HC-8 CHLORINATED**
**Alkaline Detergent**
Designed for heavy duty soil removal on all food processing equipment. Converts heat-hardened solids into more soluble form through chemical reaction. Chlorinated for improved detergency. Exceptionally effective on animal or vegetable fats.

**FLASH-KLENZ**
**Organic Acid Detergent**
Neutralizes and dissolves baked-on deposits. Excellent for de-liming and penetrating mineral-bonded soils. Keeps equipment film-free and restores original lustre of surfaces. Non-corrosive. Extra efficient in problem water areas. For alternate use with Flash-Kleen.

**KLENZADE XY-12**
**Sodium Hypochlorite Sanitizer**
Powerful bactericidal action, yet safe for all food handling equipment. Backed by over 25 years of popularity in food operations. Clear liquid easy to mix in use dilution. Leaves no sediment or residue. Stable; excellent keeping quality; high strength.

*Ask About Our Sanitation Surveys*
**KLENZADE PRODUCTS, INC.**
*Systematized Sanitation All Over the Nation*
**BELOIT, WISCONSIN**

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## Traces of Silver in Cement Floor Inhibit Bacteria Growth

Protects floors from pitting and eventual disintegration

Concrete flooring that has minute quantities of silver added to it should last much longer in food processing plants.

Common cause of concrete deterioration in food processing areas is the action of bacteria upon small amounts of food spilled on floors and traces of the food which remain even after the floors are washed. Acids are produced by fermentation which acts on the concrete causing pitting and eventual disintegration.

Silver, added to the cement is a collodial or salt form, greatly inhibits growth of bacteria and fungus. Just how the silver achieves its bactericidal qualities is not known. However, bacteriologists have known for a long time that silver does possess great bactericidal qualities.

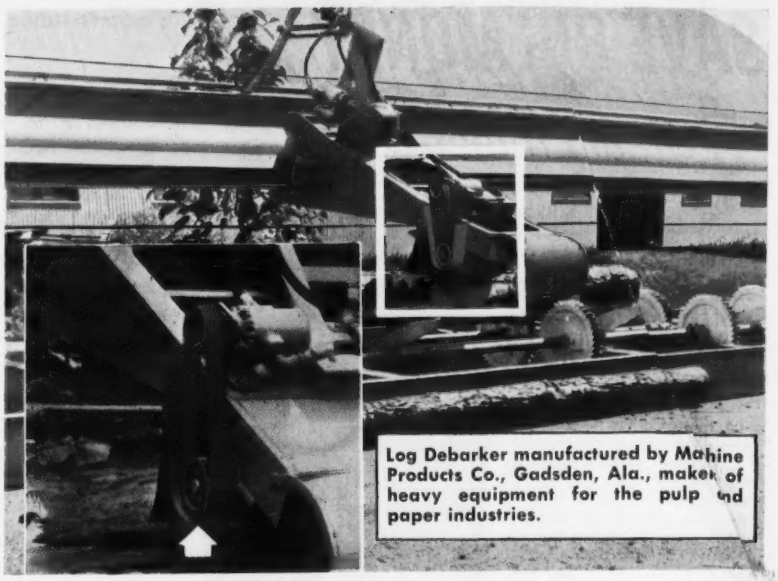
The silver is introduced to the concrete mix while still in the rotary mixer in quantities up to 0.005% by weight of cement. Thus, bactericidal agent is uniformly dispersed throughout the entire floor topping.

Several tests have been conducted, inoculating concrete floors and bactericidal concrete floors with various bacteria to determine just how effective the bactericidal floors were in inhibiting growth of bacteria and fungus.

Previous to bacterial inoculation, floor samples were washed in a manner simulating weekly washing of the surfaces over a period of one year.

In the initial tests, samples were inoculated with 10 million E. Coli organisms and fed with tryptose phosphate nutrient broth. This provided the most favorable environment for growth — food and moisture.

After one day, 320 billion bacteria were recovered from



Log Debarker manufactured by Machine Products Co., Gadsden, Ala., maker of heavy equipment for the pulp and paper industries.

## This V-Belt Drive costs less, takes shock loads chain couldn't handle!

***Another manufacturing problem solved by the high capacity of Gates Super HC V-Belt Drives...***

The makers of the Log Debarker shown above found that the chain drive on the debarker head could not always handle the shock loads characteristic of this operation.

To insure buyers of this machine top performance and freedom from down time, Machine Products Co. replaced the chain drive with Gates Super HC Drive.

Not only have they eliminated down time and replacement costs from shock-load breakage of the chain, the makers have also actually cut manufacturing costs because the Super HC Drive permits a smaller debarker head.

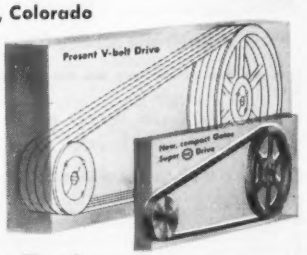
**Nation-Wide Engineering Service**

A Gates Distributor or Field Representative will show you how Super HC V-Belt Drives reduce sheave diameters 30% to 50%, reduce drive space up to 50%, and drive weight 20% and more. To learn more about Gates Drive Engineering Service ask him for a free copy of "*The Modern Way to Design Multiple V-Belt Drives*" or write the Gates Rubber Co., Sales Division, Inc., Denver, Colorado.

TPA 475

**The Gates Rubber Company,** Denver, Colorado
**Gates Rubber of Canada Ltd.,** Brantford, Ontario

Gates
*World's Largest Maker of V-Belts*




**Gates Super HC V-Belt Drives** same hp capacity in smaller "package"

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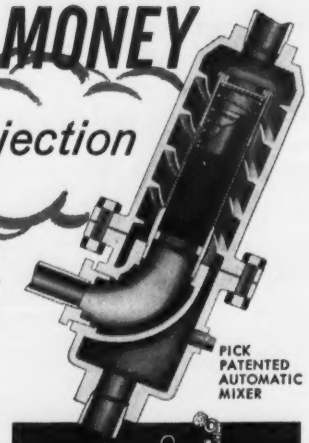
# SAVE BIG MONEY

## Steam Injection

INSTANTANEOUS
**HOT WATER**
FASTEST, MOST ACCURATE

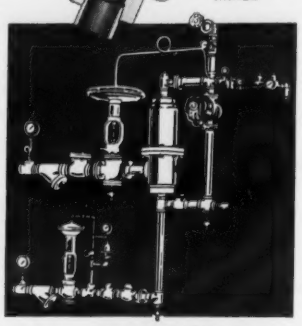
8 SIZES — 500 TO 50,000 GALS. PER HOUR



PICK PATENTED AUTOMATIC MIXER

New jobs . . . old ones requiring modernization — nothing compays with a Pick heater! Liv steam mixed with water, only as water is drawn. All of he heat of steam is used — none wasted on keeping stred water at correct temperure. Temperature maintained within 3° plus or minus. Volume adjustable from 5% to full rated capacity. 20-second reaction to desired up-and-down changes in water temperature.

Operates on low or high pressure steam. Uses no floor space; usually attached to wall.



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the plain concrete floor as compared to only 52 billion from the bactericidal concrete floors. After seven days, bacteria recovered from the plain concrete floor numbered well over six billion, while only 1½ million were recovered from the bactericidal floor.

In another test, floor samples were inoculated with 300,000 Bacillus Subtilis organisms (an acid-producing bacteria) planted in 10% Difco dehydrated. After two days, 10 million bacteria were recovered from the plain concrete, but only 100 were recovered from the bactericidal concrete floor.

Tests were also made with 1,520,000 Staphylococcus Aureus organisms planted in 0.85% saline solution. In this case, bacteria recovered from the plain concrete floor after one day numbered 550,000; from the bactericidal concrete floor, only 3000.

In tests for resistance to fungus, results indicated that at the end of 12 and 17 days, there was definite mold growth on the plain concrete floor, but none on the bactericidal concrete floor.

(Bactericidal concrete flooring is a development of Kalman Floor Company, Inc., 110 E. 42nd St., New York 17, N.Y.)
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## Repair Damaged Equipment Rapidly

**Quick-setting epoxy material mends leaks, breaks, cracks, etc.**

**Uses:** Quick-setting epoxy material in multi-use repair kit, enables on-the-spot repairs to equipment, pipes, tanks, valves, fixtures, machinery, gutters, plumbing and numerous other plant items.

Damage such as breaks, leaks, cracks and wear can easily and quickly be repaired.

**Features-Description:** Repair material has excellent adhesive properties to all surfaces including glass, wood, metal, plastic, concrete, etc.


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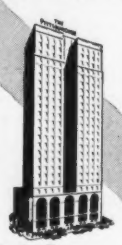

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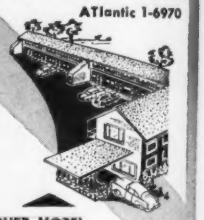

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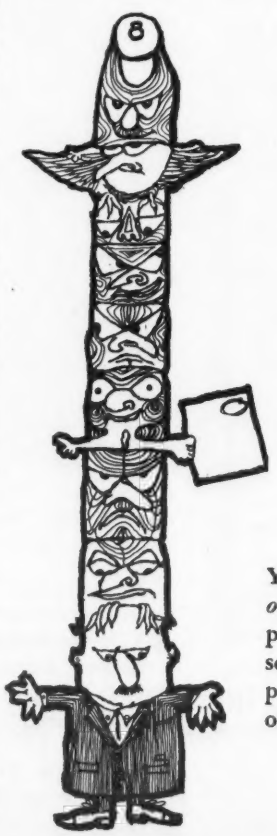

## are you the low man on the totem-pole?

**. . . always last to receive FOOD PROCESSING?**

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About the only surfaces that will not bond are polyethylene, Kel-F and non-etched Teflon.

Two type resins are available. One is a general repair material with good chemical resistance for repairs to most surfaces.

The second resin, in addition to equally good repair qualities, also offers greater resistance to chemicals. This material, therefore, is recommended where chemical attack is of major consideraton.

Each kit contains a jar of resin and a jar of catalyst, fiberglas cloth, measuring spoons, stirring paddles and instruction booklet.

Catalyst is added to the resin which starts a chemical curing action. Curing depends upon chemical rather than solvent evaporation. Therefore, repair material is non-shrinking, curing to a tighter mass with a much stronger bond.

Resin is available in two forms: cartons of six kits, with each kit containing about 2¾ ounces of material, or in quarts.

(Carbo Fix repair kits S and C — C offers the greater chemical resistance — are a product of Carboline Company, 32 Hanley Industrial Court, St. Louis 17, Mo.)
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### Offers extensive line of roller chains, sprockets

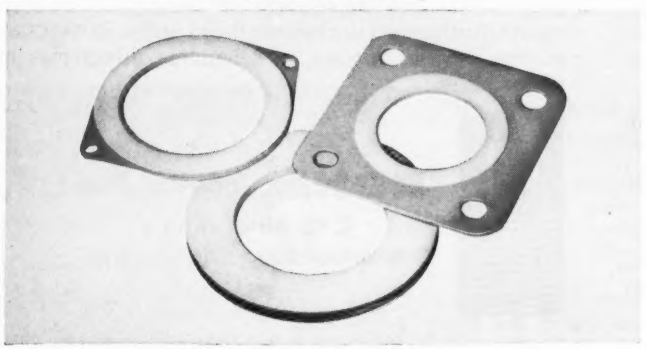
An extensive line of roller chains and Taper-Lock sprockets is offered in 56-page bulletin.

Line of roller chains includes a single strand, double strand, single strand heavy series, double pitch drive, double pitch conveyor, double pitch conveyor with large rollers and standard attachments.

Photographs and diagrams show construction details of Taper-Lock sprockets for easy and secure mounting on shafts. Steel plate and bored-to-size sprockets are also listed together with weld-on hubs and Taper-Lock bushings for spe-

**ENGINEERED TEFLON* PRODUCTS**
for Food Processing

Lattice-Braid Teflon Packings



Teflon-jacketed Gaskets

**LONG, TROUBLE-FREE SEALING AGAINST REACTIVE MIXTURES, BLENDS**

Here are two natural suggestions for sealing reactive materials . . . sealing that won't leak, that lasts with little maintenance, that won't contaminate the food being processed:

**Garlock Lattice-Braid† Teflon Packings** are engineered for strength, long life—and are chemically inert. Less gland pressure is required to effect an adequate seal, resulting in longer sleeve and packing life, less downtime and maintenance. Add to these features the advantages of Teflon: resists chemical action and cleaning processes and is non-contaminating; extremely low coefficient of friction; withstands temperatures ranging from −120° to +500°F. In Lattice-Braid construction each strand passes diagonally through the body of the packing at a 45° angle. This through-and-through braiding makes a completely unified structure of greater strength. Ordinary braided packings become worthless once the single outer braid is worn through. On Lattice-Braid, there is no single outer braid; the braiding, therefore, holds together far beyond the limits of other packings, resulting in longer life. Apply to pumps and valves. Catalog AD-131.

**Garlock Teflon-jacketed Gaskets** give you the advantage of using Teflon without sacrificing resiliency and deformability . . . particularly important on process equipment, piping, flanges and fittings. Garlock offers Teflon-jacketed gaskets in four basic designs—slit envelope, milled envelope, formed shield, and double jacket. Once you've selected the design best suited for your application, choice of filler material and thickness of the gasket become extremely important. Here, too, Garlock has a material for every operating condition —for high pressures, a corrugated stainless steel filler is suggested. Where the application is for low bolt loads, a rubber filler should be sandwiched between woven asbestos cloth. Cork, rubber, asbestos are just a few of the filler types available. Catalog AD-154.

**For prompt service,** call your Garlock representative at one of Garlock's 26 sales offices and warehouses throughout the U.S. and Canada. Or, write

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cial requirements.

Complete with selection data and list prices, bulletin also includes general information on installation of roller chain drives, calculation of center distances, horsepower ratings, conveyor engineering and instructions for lubrication and maintenance.

(Bul A691 on roller chains and Taper-Lock sprockets is available from Dodge Manufacturing Corporation, Mishawaka, Indiana.)
7030 on Reader Service Slip.

### Hose stations provide hot water at controlled temperatures

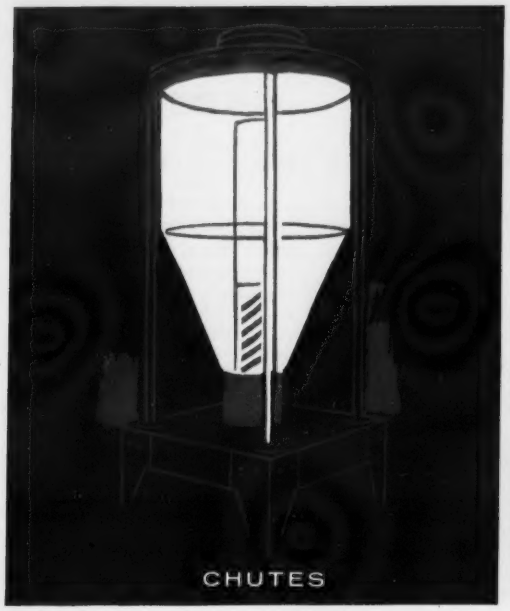
Two types of hose stations for delivering hot water at controlled temperatures are available to food processors. Units produce hot water by automatically mixing different combinations of hot water, cold water and steam.

One unit is a thermostatic steam and water mixer which delivers hot water at exactly controlled temperatures.

Operator merely selects desired temperature with a regulator handle. Once selection has been made, hot water is delivered at a constant temperature.

View of thermostatic steam and water mixer. To operate, two supply line valves are opened (steam and water or hot and cold water) and temperature is selected by a simple movement of regulator handle

Changes or failure in supply line pressure and temperatures are automatically compensated for. Control is assured by a bi-metal thermostat which re-

**Plexiglas** keeps contaminants out—profits in!

clear sheets and transparent or translucent colored sheets. Authorized distributors are listed under PLEXIGLAS in the Plastics section of telephone directories in major cities.

Windows, partitions, skylights and lighting shields in food processing areas are ideal glazing applications for PLEXIGLAS, the durable plastic that "gives" with a blow.

Machines, containers and conveyors can be protected from contamination, with transparent hoods, lids, covers and see-through sections of impact-resistant PLEXIGLAS.

You don't have to worry about corrosion or weathering when you install PLEXIGLAS—available in crystal clear sheets and transparent or translucent colored sheets. Authorized dealers are listed under PLEXIGLAS in the Plastics section of telephone directories in major cities.

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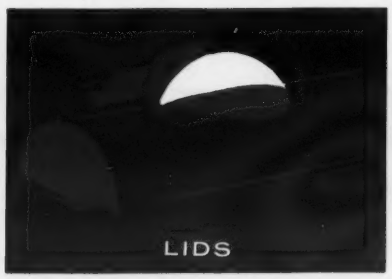

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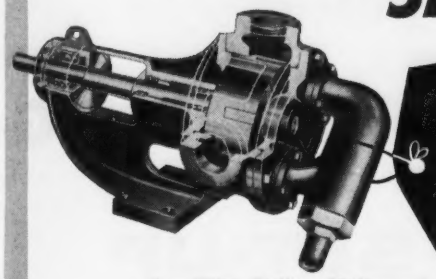

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acts instantaeously to changes in temperature. Should either the hot or cold supply line fail, the thermostat will react violently one way or the other and shut off the complete flow of water through the delivery pipe.

The other hose station is a manually operated steam and water blender for application where thermostatic control is not necessary.

Blender is easily and quickly adjusted to desired temperature and volume for washing down trucks or equipment, hosing down floors, flushing vats or tubs and many other applications. Blending chamber contains no moving parts.

Both hose stations are equipped with ¾" stop and check valves, ¾" hose connections and a stainless steel hose rack.

(Leonard Hose Stations are a development of Leonard Valve Company, 1360 Elmwood Ave., Cranston 7, Rhode Island.)
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### Help in solving pipe corrosion problems

Qualities and applications of ductile iron pipes are subject of 20-page booklet designed to be helpful in solving pipe corrosion problems where piping is exposed to extreme chemical and acid conditions.

Ductile iron, a cast ferrous metal, combines strength of steel with corrosion-resistance of gray cast iron.

Illustrated booklet contains tables which set forth physical and metallurgical properties of ductile iron pipe and compares its corrosion resistance in various media.

Specifications are given for various type joints, including mechanical joint, flanged joint, etc., as well as for plain or threaded end ductile iron pipe. Specifications are also provided for various fittings in ductile cast iron.

("Clow Ductile Iron Pipe and Fittings," is available from James B. Clow & Sons, Inc., 201 N. Talman, Chicago 80, Illinois.)
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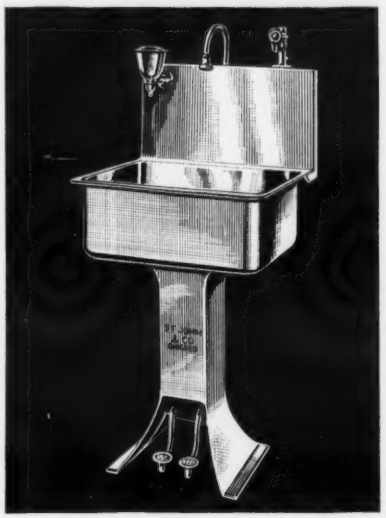
# SANITARY!

## STAINLESS STEEL LAVATORY

by St. John



Designed for use wherever sanitation requirements are exceedingly high, this low-cost St. John lavatory is a remarkable achievement in every detail.

Originally intended for use in packing-houses where it meets and surpasses all requirements for federally-inspected plants, it has found wide application throughout the food industry because of its smart appearance, functional design and many practical features.

For example:

- **Extra Deep Bowl** — with smoothly rounded inside corners. Deep-drawn of type 302 stainless steel, seamless and handsomely polished.
- **Splashback** — drains into the bowl. Made of smooth, seamless stainless steel.
- **Unbreakable Soap Dispenser**—chrome plated, permanently fastened to splashback. Suitable for liquid or powdered soap.
- **Spray**—chrome plated, with aerating nozzle.
- **Foot Operated Valve**—hot and cold water separately controlled or mixed.
- **Pedestal**—heavy cast aluminum alloy, resistant to virtually all acids and alkalis.
- **Simple Installations**—attach to water lines and drain. Spray is piped from foot valve at factory.

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## At Helms Bakeries, Los Angeles . . .

# MODERNIZE FLOUR HANDLING WI

# OF EXISTING SET-UP

Here is example of how a large metropolitan bakery, faced with a critical space-shortage and with no possibility of lateral expansion, was able to install a needed modern bulk flour system, yet make maximum use of existing facilities.

Until recently, Helms Bakeries of Los Angeles, Calif., handled its flour requirements on a semi-automatic basis. Two men dumped sacked flour into blenders at maximum rate of 200 lb per min. From blenders, flour was conveyed pneumatically to the daily use bins.

Part of Helms' problem, in considering modernization, was how to take advantage of three flour blending units hardly eight years old. Since this type of equipment ordinarily has life expectancy of 25 years or more, Helms officials understandably wanted to salvage the blenders.

**Key steps** in solution were installation of bulk flour storage bins and reworking of the flour blenders.

The twelve 12-ft-sq by 24-ft-high storage bins occupy only half the square footage formerly needed for sacked flour, yet the capacity for storage is unchanged.

Each bin has capacity of slightly in excess of two bulk truckloads, or 80,000 lb of flour. The bins are grouped for interconnection should flour recirculating be required later (each of the four units in layout sketch above consists of three storage bins).

The three original flour blenders were simply reworked to make them airtight, then equipped with filter sleeves, inspection doors and high- and low-level indicators (see photo).

Blenders, in turn, were connected to the bulk storage bins by two two-in. transfer lines, each capable of transferring flour at rate of 175 lb per min.

Level indicators of the blenders control the flow of flour from the bulk system. Once set for any one of three types of flours handled by Helms, they draw and shut off the flour automatically (according to demands of the use bins) by actuating the electrical control panels of the bulk system.

Replenishing the bulk flour bins is as automatic as supplying flour to the daily use bins.

When flour is delivered to the bakery via bulk truck, a single hose connection is made to a four-in. loading manifold. When connections are completed, operator simply selects the bulk bin to be loaded, depresses the bin-loading start button and the flour is on its way.

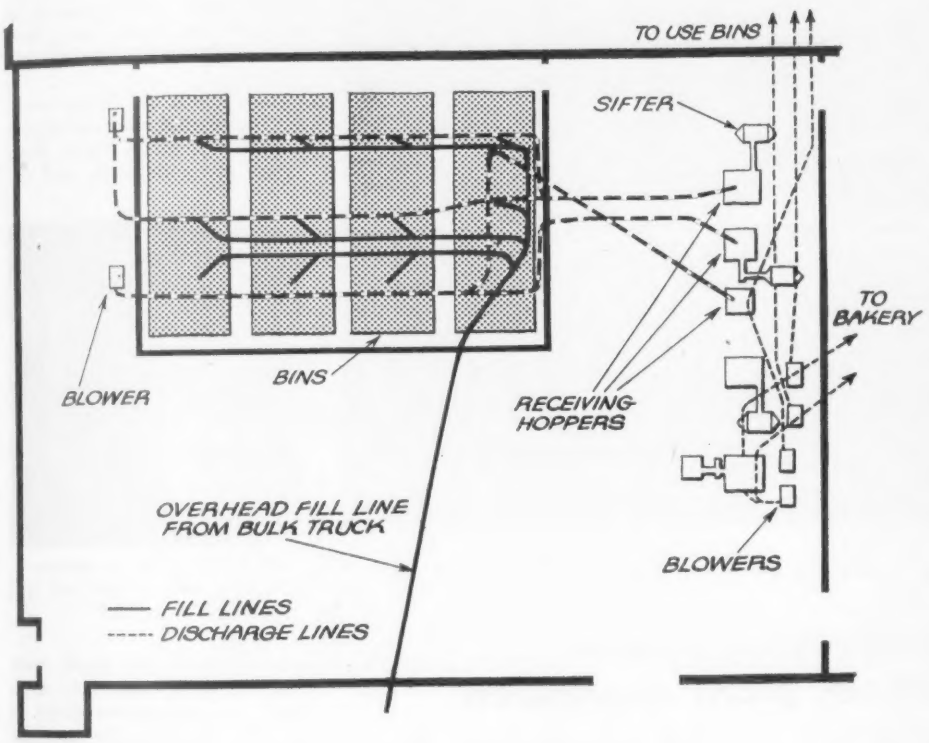
Unusual feature of the replenishing operation is that the conveying air from the truck to bin is dissipated by a unique central exhaust system which does away with filter sleeves atop the bins (photo). Any flour dust picked up by the central exhaust fan is automatically fed back to the bin being filled.

**Results of new system** have proven to be practical as well as profitable. Not only was company able to salvage the blenders and reclaim more than half of the former sacked flour storage area, but sanitary conditions are improved, sack costs eliminated, handling and "housekeeping" costs reduced and invisible losses minimized.

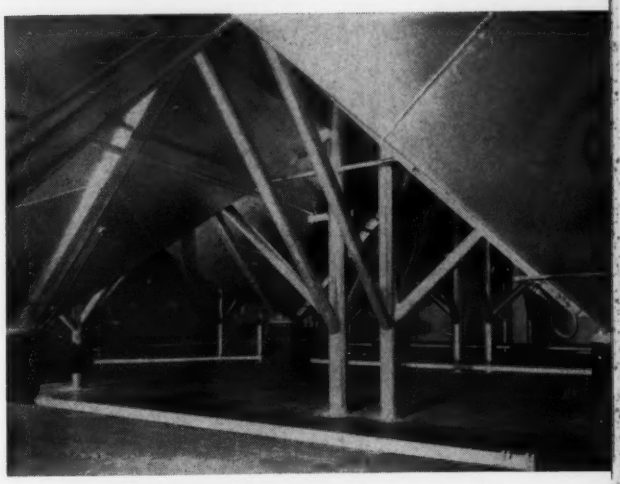
During first six months of operation, new system

View across top of bins, showing pneumatic lines. Bins are served by a central exhaust system

# NG WITH MINIMUM MODIFICATION




Simplified layout of Helms' new bulk flour handling system. Note how bins were grouped to free floor space, foreground — some of which is used to store special flours. Salvaged blenders (receiving hoppers), upper right, connect to bulk bins by two-in. transfer lines, act as accurate monitoring center in supplying flour to daily use bins. At bottom right are standby, semi-automatic blenders

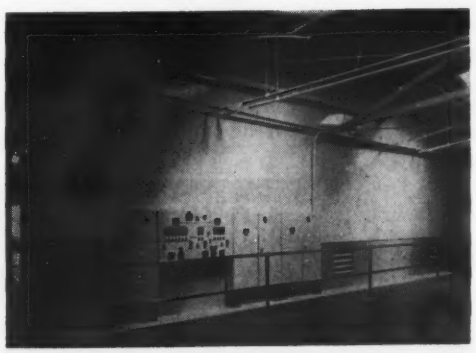


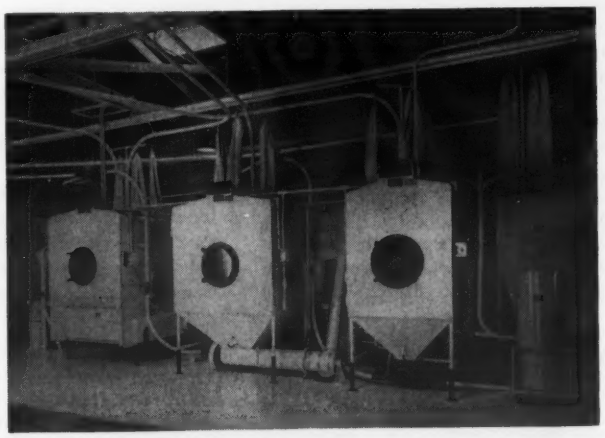
Each storage bin has 45-degree, concentric hoppered bottom, equipped with vibrator and air jet to aid in discharging

dropped the bakery's flour-handling costs by an estimated 25 cents per hundredweight. Furthermore, the system is so well integrated in automatic operations that only one operator is needed to control it.

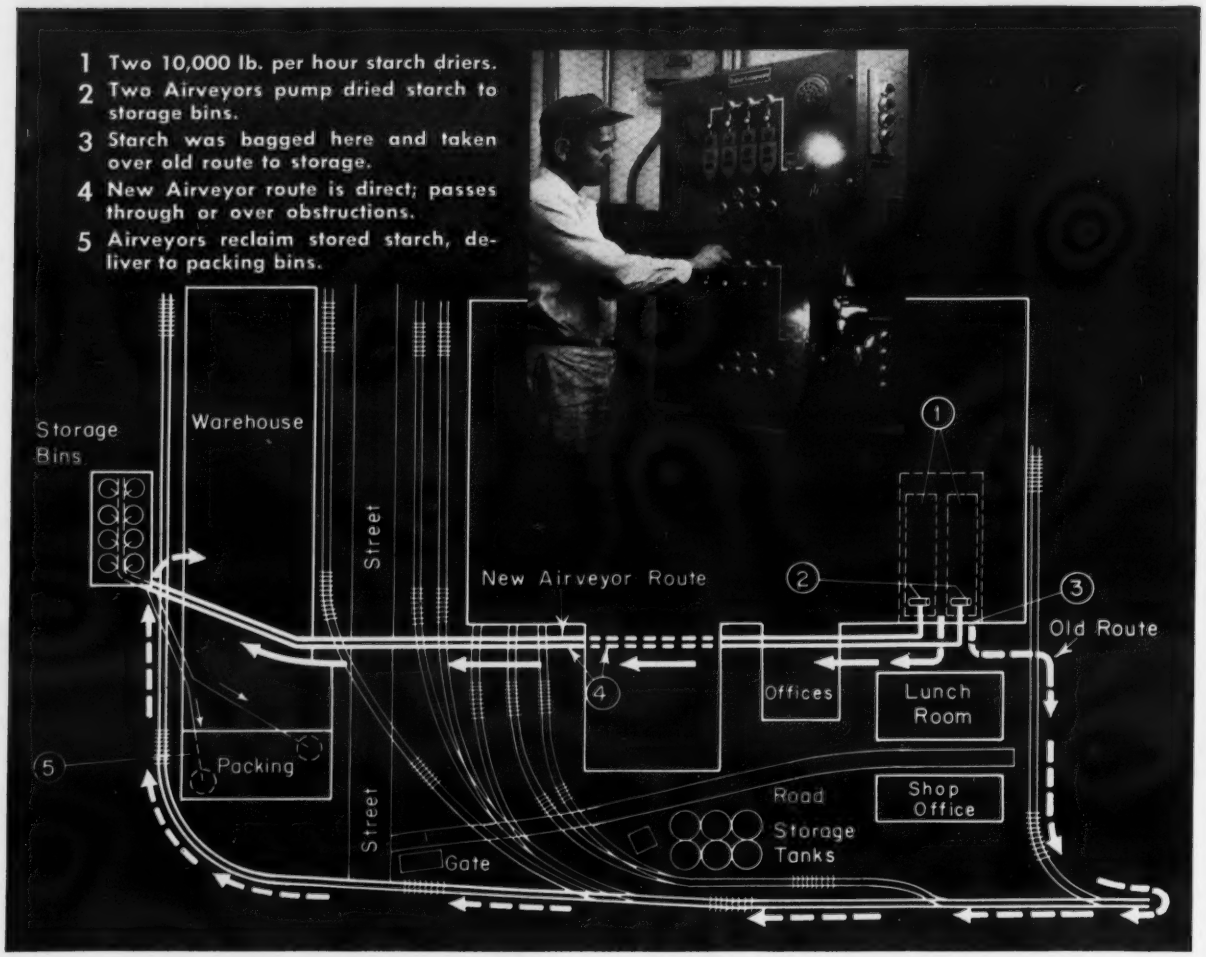
(Complete bulk flour handling system at Helms Bakeries, Los Angeles—including bulk flour storage bins, flour blenders, blowers, daily use bins, electrical control center, pneumatic lines and exhaust system — was engineered, manufactured and installed by Baker Perkins Inc., Food Machinery Division, Saginaw, Mich.)
7036 on Reader Service Slip.

Although grouped in this dust-tight electrical control center, each of system's controls are in separate panels, each with its own disconnect switch





Reworked flour blenders serve as control center for monitoring of flour between bulk storage bins and daily use




PLANT MODERNIZATION THROUGH PNEUMATIC CONVEYING

## FULLER pneumatic conveying system increases production without plant expansion

To increase production, the Union Starch and Refining Company's Granite City, Ill., plant first needed to expand their materials handling system. But a complete revamping of bagging and warehouse operations was impossible because there was no space available for necessary new buildings.

An Airveyor® System, engineered and built by Fuller, was the answer. Airveyor's extreme flexibility allowed it to be set up through walls, along sides of buildings, over streets, on roofs and up inclines. At Union Starch, the total distance covered is 800 feet, with a number of 45 degree and 90 degree bends in the line.

The Fuller Airveyor system transports the starch in two phases, from the driers to the storage bins and from the bins to receiving hoppers over the bagging machines. Flow is controlled automatically through control panels located in the drier room and at the bagging machines. Other controls are also provided at the panels for automatic operation of components such as feeders, blowers, conveyors and filter-receivers.

Besides being easily installed and automatically controlled, the Fuller system reduces both the amount and the expense of handling. Additional savings are made possible by Airveyor's self-cleaning facility, which greatly reduces maintenance costs.

Why not work with Fuller to design an automated pneumatic materials handling system that will help you cut costs and increase production? Write today for complete details. A-280 1353

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**For frozen foods . . .**

# Fiber bulk bins replace wood

**Collapsible, reusable storage units are lined with polyethylene bags**

Fiberboard tote bins for IQF (individually quick frozen) vegetables are replacing wooden bins on the West Coast, after going through a trial stage that has now proved them commercially acceptable.

Two types are being used: all corrugated, and corrugated sheets in a metal frame. Both types are collapsible and reusable. Each is lined with polyethylene bags (1½ to 2 mil). A corrugated sheet is placed on top to prevent bleaching of product from warehouse lights.

All-corrugated bin is reinforced by inner posts of wood and by exterior battens

The bins hold 1000 to 1400 lb of product in bulk form until orders for specific labels are received. This eliminates the double wrapping operation entailed by packing during season into retail packages. It gives plant more flexibility, and extends the packaging season.

Packers use several methods to reinforce bins against bulging. Wood corner posts are generally placed inside and wooden battens around outside.

Some packers make their own reusable battens from old belting. These are hinged to fit over bin.

(*Continued on page 98*)

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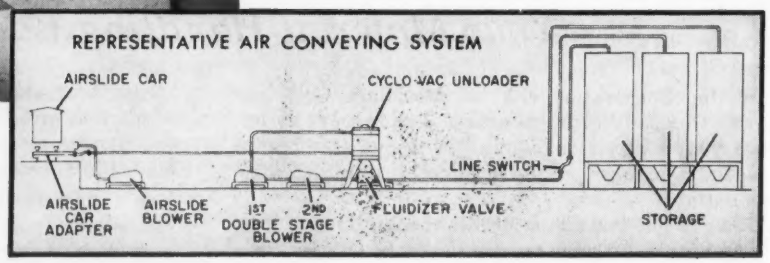


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**THE FLUIDIZER COMPANY**
**List of Representatives**

Akron, 437 W. Cedar St., JE 5-3306
Baltimore, 1223 Northern Pkwy., ID 5-5524
(Sherwood House)
Buffalo, (Orchard Park) 25 E. Quaker St., ID 3985-6
Houston, P. O. Box 654, HO 5-5084
Los Angeles
(Pasadena) 919 E. California Blvd., MU 1-9764
Louisville
(Jeffersonville) 204 Rosewood, WH 4-0512
Omaha, 5101 Blondo St., GL 3803
Philadelphia, 26 Summit Grove Ave., LA 5-6261
(Bryn Mawr) LA-5-8699
Roanoke, P. O. Box 706, DI 5-7442
St. Louis, 5850 Delmar Blvd., PA 6-1492
San Francisco
(Daly City), 375 S. Mayfair Ave., PL. 5-8256
Seattle, 1331 Third Ave., MU 2-6195
Spokane, 1324 N. Ash, FA 7-6624
Ft. William, Ont., 430 Waterloo St., 27733
Montreal, P. O. Box 1043, Station "O", RI 4-4967

7039 on Reader Service Slip.


## material handling

(*Continued from page 96*)

At Lamb-Weston, Inc., Weston, Oregon, a collapsible metal frame is used into which are placed reusable corrugated sides. Their 32"x48"x 53" bin holds over 1000 lb of peas, and stacks four or five high in the warehouse.

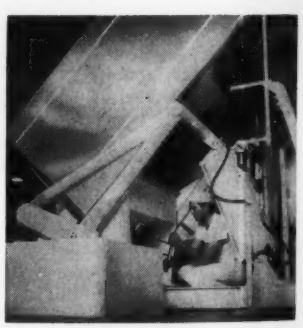
Lower capital investment and less storage space are main economic factors for switching to the bulk bins.

(Fibreboard tote bins are made by Fibreboard Paper Products Corp., 475 Brannan St., San Francisco 19, Calif.)
7040 on Reader Service Slip.

### For low headroom plants — new pullover Tote Tilt

Relocation of the air cylinder actuator to the front of new-style Tote Tilt (discharge mechanism for Tote Bins), rather than the back, allows its use without increasing headroom requirements—particularly important in plants with low headroom.

New pullover Tilt totally eliminates the chance of lift truck damage to gaskets, and



Tilt is available both as a screw- and gravity-discharge mechanism

has the added advantage of permitting a gasket, dust-tight seal between Tote hopper and the surge hopper into which it feeds.

The unit, including the sealing gaskets, remains in fixed position while the Tote Bin makes contact with the gaskets and hopper.

(New-style pullover Tote Tilt is manufactured by Tote System, Inc., 680 S. Seventh St., Beatrice, Nebr.)
7041 on Reader Service Slip.

### Infeed timing screws suit any filler-feed need

Well-known line of feed screws now can be purchased for use on other machinery from firm which designed the

Screws are fabricated to provide exact pitch and correct pocket (straight side or contour) for specific containers

original constant-pocket accelerated-pitch feed screws for use on its own automatic fillers.

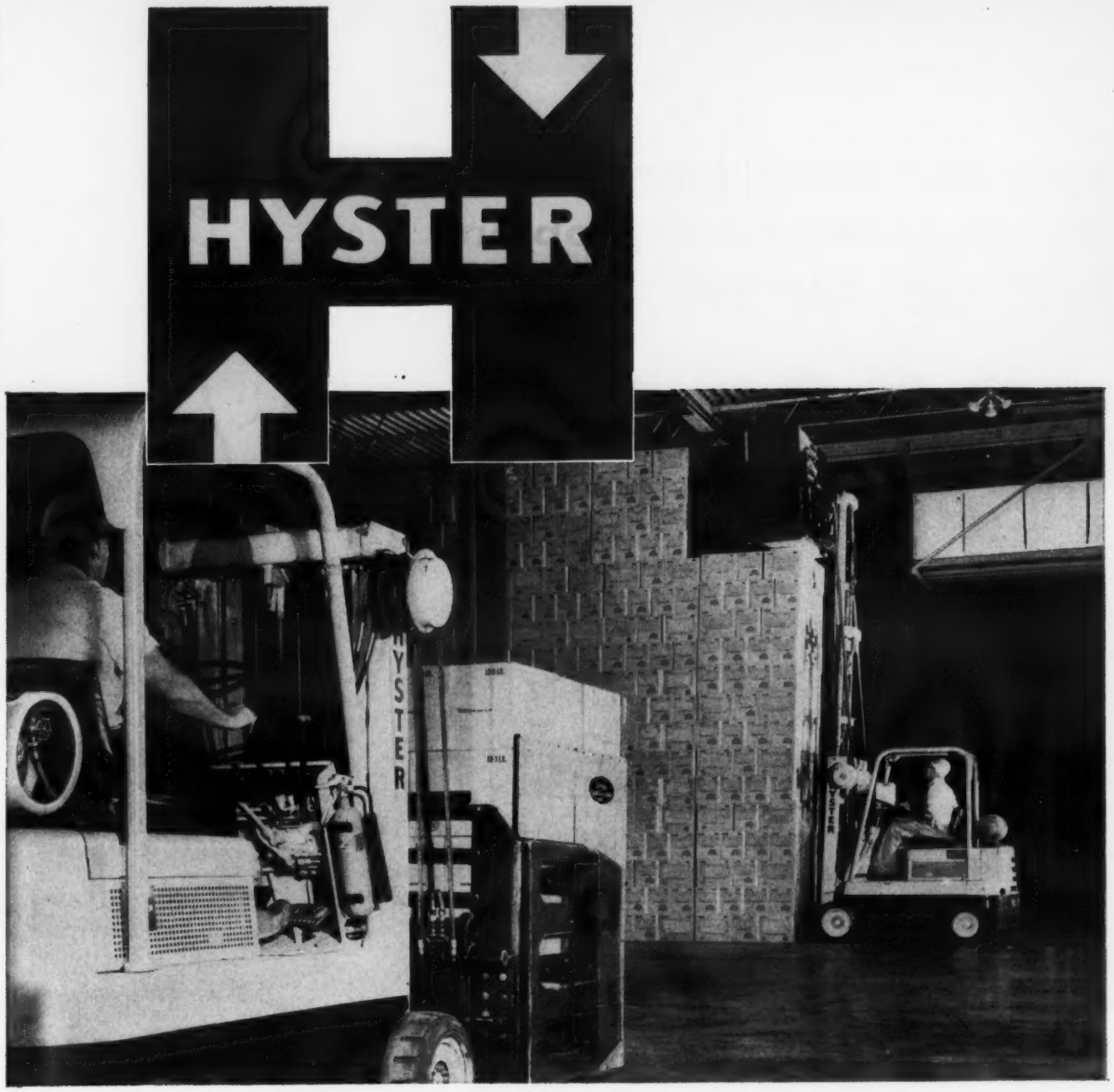
Timing-control screws can be made in almost any dimension, and from a choice of many different materials — including a number of plastics and metal, plated or unplated.

(Infeed timing screws for automatic filling equipment are manufactured by Horix Manufacturing Company, Corliss Station, Pittsburgh 4, Pa.)
7042 on Reader Service Slip.

### New specifications, grades for hardwood pallets

Designed for assistance of all who purchase hardwood pallets throughout the country, new "Specifications and Grades" for hardwood warehouse, permanent or returnable pallets supersedes the "Minimum Standard Specifications" issued in June 1954, and is a companion piece to the NWPMA "Minimum Standard Specifications for Warehouse Pallets of West Coast Woods", released in February 1959.

New specification creates four vertical, well-defined grades for hardwood pallets — "precision," "premium," "AA" and "A" — spelling out lumber and workmanship defects allowable in each grade


**The latest in palletless handling—**

# HYSTER® has it!

**New Cart-N-Grab® clamp** — thin, non-skid aluminum plates—precision side-shifting—controlled clamping pressure.

plus

**Hyster SpaceSaver®**—the newest cushion tire warehouse truck—shortest turning radius—power steering—engineered accessibility.

plus

**Exclusive Monotrol control**—safer, faster, more productive.

Call your Hyster dealer, or write for literature

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
FACTORIES: Portland, Oregon (Home Office); Danville, Peoria, Kewanee, Illinois. Sao Paulo, Brazil; Glasgow, Scotland; Nijmegen, The Netherlands; Sydney, Australia (Licensee)

HYSTER COMPANY
INDUSTRIAL TRUCK DIVISION
P. O. Box 847 • Danville, Illinois

7043 on Reader Service Slip.

(if any), and affording the user a precise, comparative method of measuring wooden pallet quality.

"Specifications and Grades for Hardwood Warehouse, Permanent or Returnable Pallets," 20 pp, is available at cost of 50 cents per copy from National Wooden Pallet Manufacturers Assn., Barr Bldg., Washington 6, D.C.

### How 'right' control panels key handling efficiency

Selecting the right control panel for a wide variety of automatic material handling systems is subject of new, illustrated bulletin, which explains the four basic types — "walk-in" master control panel, floor- and wall-mounted types and explosion-proof type.

Schematic drawing shows system used to control unloading, reclaiming and processing of materials in a brewery. Panels used in other food and non-food applications are shown.

Inside back cover is a chart of standard symbols used in graphic representation of electrical circuitry.

("Fuller Control Panels," Bul G-9, 12 pp, is available from Fuller Company, Subsidiary of General American Transportation Corp., 176 Bridge St., Catasaqua, Pa.)
7045 on Reader Service Slip.

"Hand me my little 'go to hell' stamp!"


# How our small plant solved its waste disposal problem WITHOUT CAPITAL OUTLAY....

Pat. No. 2,900,096

## DEMPSTER-DUMPMASTER Equipped Hauler Provides Containers and Service for Small Fee

Our small Midwestern manufacturing firm did not generate enough refuse to justify ownership of its own refuse disposal system. Yet, it was plagued by unsightly trash piles, fire hazards and scattered refuse in the plant yard.

Our plant engineer then heard of a DEMPSTER-DUMPMASTER equipped private hauler in the adjoining city. A survey revealed that two big-capacity refuse containers, placed one at each end of the plant, would handle the entire refuse accumulation.

The private hauler placed the containers, and a small monthly fee covered maintenance, labor, hauling and dumping refuse. No capital outlay was involved, disposal costs were reduced, and plant housekeeping was vastly improved.

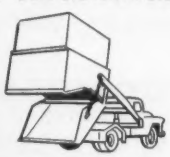
In all major cities, private haulers who own DEMPSTER-DUMPMASTER equipment render fast, efficient, low-cost refuse storage and collection service. They place one or 100 containers at your service for a reasonable fee. A free brochure describes their service in detail.

Free Brochure and Name of Nearest Private Hauler on Request

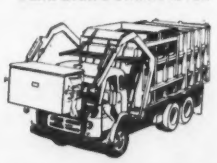
**Dept. FP-4 DEMPSTER BROTHERS Knoxville 17, Tenn. Inc.**

IN ALL LEADING CITIES FROM COAST TO COAST

DEMPSTER-DUMPSTER



DEMPSTER-DUMPMASTER



DEMPSTER COMPACTION TRAILER

DEMPSTER DUMPMASTER®
EQUIPPED PRIVATE HAULERS

7044 on Reader Service Slip.

### *that's interesting*

**Truth triumphs**

The president of a major US food advertiser, W. B. Murphy of Campbell Soup Company, recently told stockholders that, on a dollar-and-cents basis alone, and aside from moral issues involved, it had proved rewarding to avoid exaggerated product claims.

Behind Mr. Murphy's statement — Campbell Soup Company's gross sales have almost doubled in last 10 yr.

**Some swallow!**

One still occasionally hears a sigh for the "universal food pill", reports Dr. Douglas H. K. Lee of the Army's Quartermaster Research and Engineering Command.

However, when it is pointed out that the dry weight of the indispensable nutrients — protein, fat and carbohydrate — amounts to about 1¾ lb per man per day, the sigh takes on another expression.

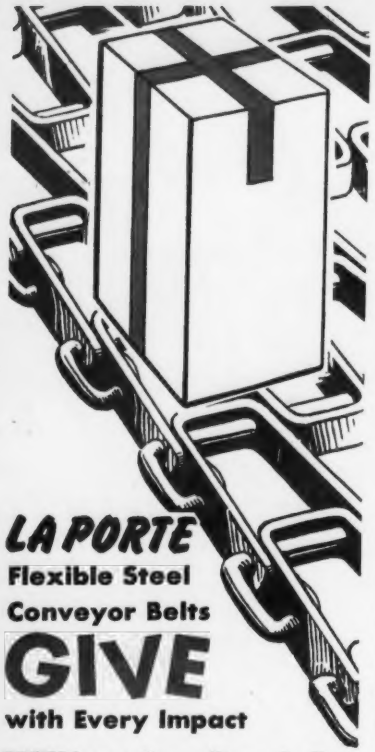
For more information on product at right, circle 7046 see information request blank opposite last page.

# Yale low-cost electrics in the 2000-3000 lb. capacity range are saving time and money for industry every day. Delicate maneuvering and deft handling are especially easy with this truck, for the mechanically actuated carbon pile speed control permits close-in inching and infinite speed variation. Twin-caster steer wheels make steering effortless, and easy right-angle turns in narrow aisles sharply increase storage space, cut stacking time. This electric truck saves maintenance overhead and "down-time" because of a minimum of moving parts and an economical powerplant. This is one of Yale's complete line of industrial lift trucks . . . the right truck for every job!

**For full information, call your Yale representative or send for free brochure #5265 to The Yale & Towne Manufacturing Co., Materials Handling Div., Philadelphia 15, Pa., Dept. KT7.**

**Yale Materials Handling Division, a division of The Yale & Towne Mfg. Co. Manufacturing Plants: Phila., Pa., San Leandro, Calif., Forrest City, Ark. Products: Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks · Worksavers · Warehousers · Hand Trucks · Industrial Tractor Shovels · Hand, Air and Electric Hoists**

YALE®
INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS · HOISTS
YALE & TOWNE



**LA PORTE**
**Flexible Steel Conveyor Belts**
**GIVE**
**with Every Impact**

WITH knee-action resiliency, La Porte Conveyor Belts flex under the shock and pressure of heavy loads on the receiving platform, at the loading hopper and the shipping dock. Yet they maintain a perfectly flat surface for products in process and containers empty or filled.

The open-mesh design keeps products from rolling off and permits the circulation of air and liquids around products in process. It also speeds up drainage and facilitates sterilizing with steam gun by one man while in motion. La Porte Belts are easily installed.

*If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.*

**MAIL COUPON TODAY**

**LA PORTE MAT & MFG. CO.**
Box 124 Dept. A
La Porte, Indiana

**Please send free literature on your Conveyor Belt.**

NAME_____

ADDRESS_____

CITY_____ STATE_____


7047 on Reader Service Slip.

### Lease or buy lift trucks? —booklet may help decide

Booklet contains a series of tables which permit a prospective lease-holder to calculate cost of leasing a truck, as opposed to outright purchase.

Complete set of instructions on use of the tables, along with sample calculations, make rate figuring a simple procedure.

Literature also covers various lease plans offered by the company.

("Elpar Lease Plans," 24-pp booklet, is offered by The Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.)
7048 on Reader Service Slip.

### How pneumatic handling can profit small baker

Detailed technical article reprint demonstrates how pneumatic handling may be practical and profitable even in small bakeries.

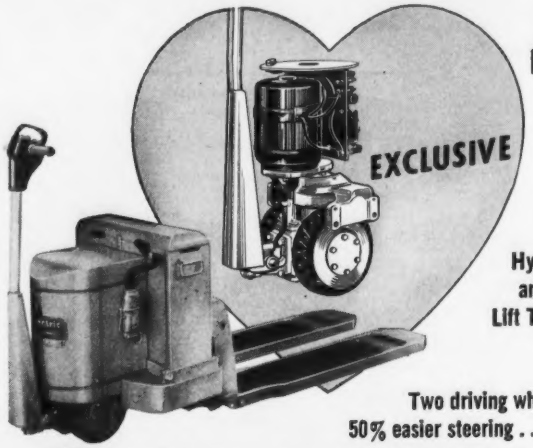
Making claim that a small-to-moderate user can save upwards of $10,000 per yr, article points out that the average baker saves 12 to 13 cents per cwt by eliminating bags — plus time and labor savings made possible by pneumatics.

Schematic diagrams of transfer systems from car to storage, from storage to use bins, in-plant and from bulk truck to plant bins are included, as well as check list for planning a flour-handling system.

("Conveying Flour by Air," Bul I-66, four pp, is offered by Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.)
7049 on Reader Service Slip.

For more information on developments described here, use the convenient self-mailing Reader Service Slip.


**HEART OF THE HydroLectric**




**. . . THE DYNA-DUAL POWER UNIT**

Compare the Hydrolectric features with any other "Driver Lead" Lift Truck. The Hydrolectric quality of construction merits your inquiry.
Two driving wheels instead of one . . .
50% easier steering . . . ease of maintenance.

NOTE: The Dyna-Dual Power Unit is interchangeable on all models.

A TRUCK FOR EVERY PURPOSE AND MATERIAL

**LIFT TRUCKS, INC.**
CINCINNATI 14, OHIO

7050 on Reader Service Slip.


**INCREASE PROFITS!**
**CUT HANDLING COSTS!**

**PUT YOUR FROZEN FOOD PROCESSING ON WHEELS**

***Midwest***
**ROLL-AWAY TRUCKS**

TRUCK SIZE
19¼" x 29" x 55"

. . . roll easily on wide tread 4" composition wheels.

. . . speed movement of packaged meats and other foods from counter or into cold room for storage.

. . . save time, plus labor and food handling expense.

. . . hold 7 large trays or 14 half-size trays, electro-plated to prevent discoloring of packages.

. . . tray sizes: 17" x 28½" x 4", 17" x 28½" x 5" or 17" x 14½" x 3½". Every joint welded . . . no open ends to catch on trucks, doors or other trays.

**WRITE FOR CATALOG AND PRICES**

MIDWEST METAL STAMPING CO. • Phone 60 • KELLOGG, IOWA


7051 on Reader Service Slip.

*that's interesting*

**Smokestacks in pastel, perhaps?**

A. O. Smith Corp., whose Process Equipment Division produces steel smokestacks lined with acid-resistant glass to prevent rust and obviate exterior painting, has now added

an aesthetic feature to the technique — colored glass. Heretofore available only in black and cobalt blue, the glass is now available in any color. Pictured here is an 8-ft diam 55-ft high installation.

For more information on product at right, circle 7052 see information request blank opposite last page.

From an Arctic 30°F. below zero to a broiling 180°F. within a few seconds—that's the temperature range in which this rugged Wissco Belt operates through the Albany Ice and Cold Storage vegetable freezing plant in Albany, Oregon.

*In food plants...*

# FAMOUS NAMES *ride on* WISSCO BELTS

## *Albany Ice and Cold Storage Co.*

The image of CF&I—this giant steelman—stands for the dependability that is built into every CF&I steel product. For Wissco Belts, this product dependability is your assurance of trouble-free performance and long-service life.

"Last summer our Wissco Metal Belt kept the vegetables moving 20 hours a day, 7 days a week, without a single major interruption, and enabled us to **increase our production five-fold,"** states Mr. Prinsen, Secretary and Manager of the Albany Ice and Cold Storage Company.

Reliable performance of the conveyor and high standards of sanitation are vital to high-speed food freezing where downtime results in costly losses through spoilage. "Our Wissco Belt has more than met the exacting standards of our business; it is the key to our operation," claims Mr. Prinsen.

The open-mesh construction of the Wissco Belt assures uniform processing of the vegetables as they are exposed to blasts of freezing air. After its cargo is frozen, the Wissco Belt drops the vegetables into a hopper. The belt then is scoured by jets of high-pressure steam.

"Sudden temperature changes have not affected the smooth-running performance of our Wissco Belt," points out Mr. Prinsen. That's because Wissco Belts are carefully constructed to prevent contraction and expansion of the conveyor—a cause of trouble with ordinary belts used in food processing.

If food processing is your business, you'll be interested in the full story on Wissco Belts. Simply contact the nearest CF&I sales office for complete information. 7293

**WISSCO BELTS**

**THE COLORADO FUEL AND IRON CORPORATION**

*In the West:* **THE COLORADO FUEL AND IRON CORPORATION**
Denver and Oakland

*In the East:* **WICKWIRE SPENCER STEEL DIVISION** — Atlanta
Boston • Buffalo • Chicago • Detroit • New Orleans
New York • Philadelphia

CF&I STEEL

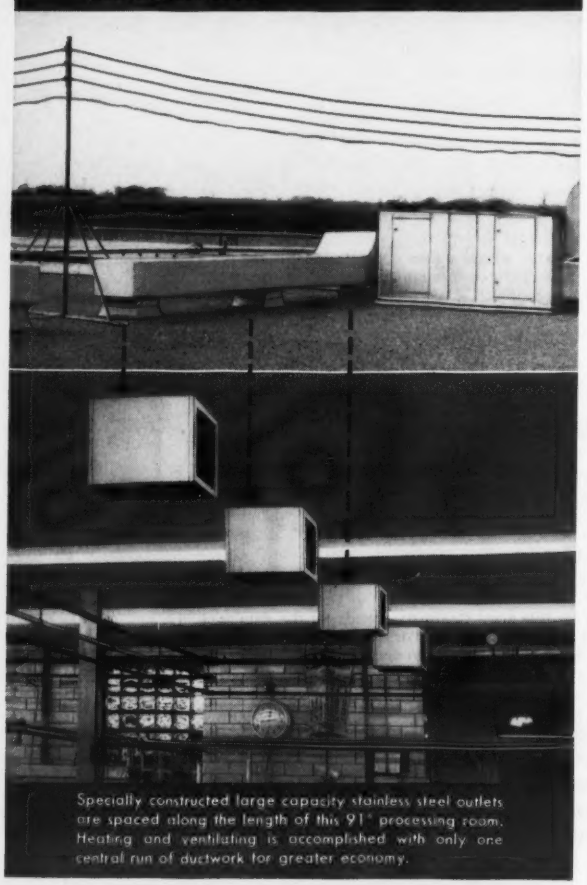
## KLIMATIC KING

*heating and ventilating units solve humidity problem for*

**BONGARDS' CREAMERY**

Bongards' Creamery likes the way Klimatic King units have solved air problems in their cheese processing plant. High humidity has been licked, walls and ceiling are dry and working conditions are better. Klimatic King assures constant temperatures, continuous air circulation and pressurized control elimination of dust problems. Available in sizes 3,100 to 20,000 C.F.M. By adding a cooling coil Klimatic King units can be used for cooling.

One of two Klimatic King units installed on roof at Bongards' Creamery, Bongards, Minnesota. Insulated ductwork carries heated air to outlets in ceiling of cheese processing room below.



Specially constructed large capacity stainless steel outlets are spaced along the length of this 91' processing room. Heating and ventilating is accomplished with only one central run of ductwork for greater economy.

*50 years of experience is at your service. Write for free technical bulletin.*

KLIMATIC KING COMPANY OF OWATONNA
911 CEDAR ST., OWATONNA, MINN.

7053 on Reader Service Slip.


## New developments in fork lift trucks

**For intermittent heavy-duty** . . . rugged, very stable 4000-lb-capacity rider-walkie electric lift truck has many design advantages of heavier duty rider-walkie gas and electric trucks.

Interlocking design of mast, made of nested I-beam sections, permits mounting widely spaced channel rollers parallel to web of beam, so that all pressures are taken on the strongest roller dimension, and scrubbing action is eliminated.

In addition, 10 side-thrust rollers effectively resist any off-center loading to which truck may be subjected.

Heavy-duty tilt cylinders are mounted high, almost parallel to ground, for maximum mechanical efficiency and faster tilting. Large drive and trail wheels roll on tapered bearings, giving minimum resistance to travel.

Excellent stability is accomplished through a 63-in. wheelbase, a width of 39 in. across the trail wheels and a widened — counterweight. Frame is a solid, welded unit of heavy steel plate.

Forks are adjustable from 12½ to 37½ in. in width. Unit also can accommodate the


# LOADmobility

. . . AT LOWEST COST!

**ECONOMICAL**—On the dock, in the plant, wherever loads must move, put 'em on Magliner Pallet Dollies and they're *always* ready to roll . . . where and when you need them!

**LIGHT WEIGHT**—*Magnesium* light, easily carried by one man. Dollies get back to loading point faster, save time and money!

**STRONG**—Rugged, all-welded construction. 2,000 and 4,000 lb. capacities. Large 3½" ball-bearing rollers. Available in 14 standard sizes.

**WRITE FOR BULLETIN P8-1**
*Magline Inc., P. O. Box 404, Pinconning, Michigan*

**Magliner Magnesium PALLET DOLLIES**

7054 on Reader Service Slip.

# "Delrin" Conveyor Chain

**Nylite Conveyor Chain is now Nylite "D" Conveyor Chain made with Dupont's new "Delrin" acetal resin**

. . . a completely new material that offers you metal-like mechanical properties, such as a high degree of strength and rigidity . . . plus properties that metals do not possess.

Under rigid comparative tests for the past two years, Nylite "D" Conveyor Chains experienced:

- no Lubrication
- 1/10 the water absorption, 1/6 the stretch of previous non-metallic type . . . and 20% heavier.
- no warpage, no buckling . . . holds better to conveyor
- no loss of rivets (switched from pins to rivets)
- longer life and lower costs than stainless chain
- higher speed than metal chain.

Now in stock: 3" — 3¼" — 4" — 4½" — 6" widths

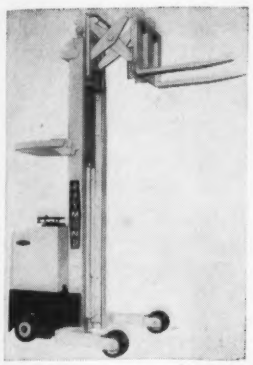
*Write today for new pamphlet*

**FENCO, INC.** | 125 N. Racine Ave. Chicago 7, Illinois

7055 on Reader Service Slip.

manufacturer's standard "Triplex" mast, to give greater lift from low over-all height.

(Worksaver rider-walkie fork lift truck is manufactured by The Yale & Towne Manufacturing Company, Yale Materials Handling Division, 11,000 Roosevelt Blvd., Philadelphia 15, Pa.)
7056 on Reader Service Slip.



**Economy version** . . . of heavy-duty narrow-aisle electric truck — offered with a single drive wheel and offset caster — supplements recently introduced dual-drive model. Both trucks are designed for applications requiring fast lifting speeds and continuous operation handling loads up to 4000 lb.

Heavy-duty lift motor, operating from large 24-v battery which powers the truck, enables the truck continuously and over long periods to raise two-ton loads as high as 20 ft without overheating.

Separate motor furnishes power for the hydraulic circuit controlling the "reach fork" mechanism, or for special attachments such as clamps, tilting forks, etc.

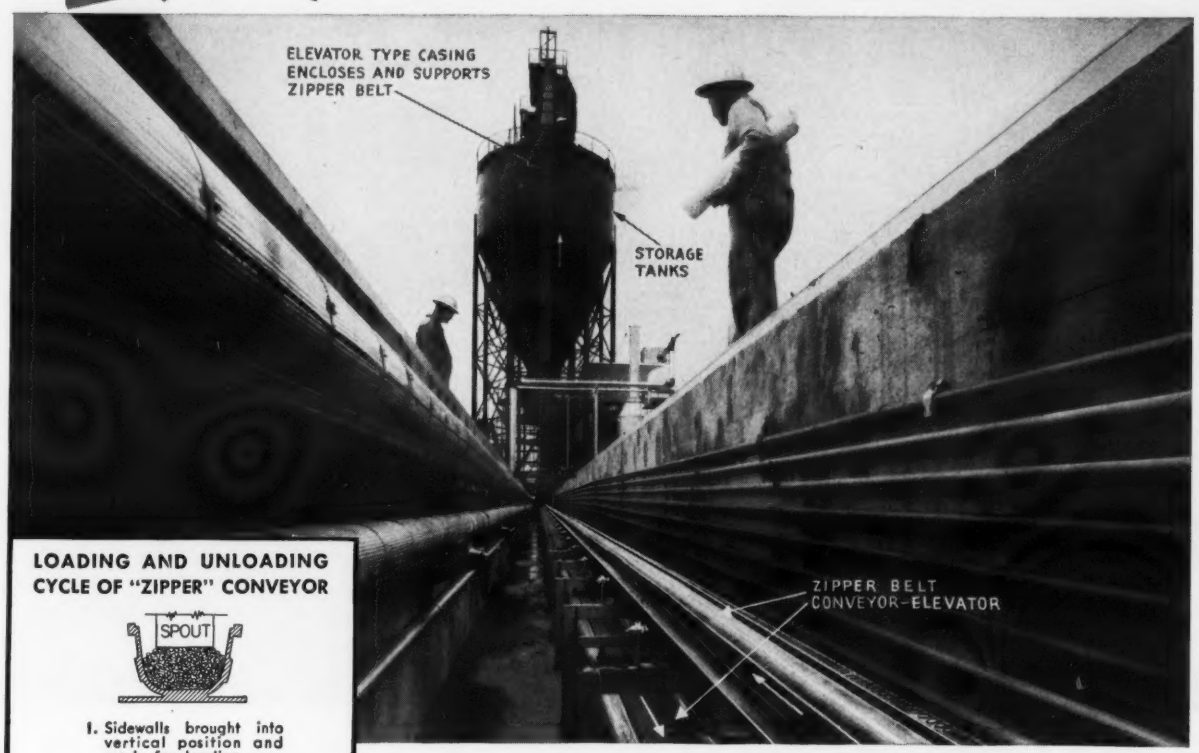
(Single-drive — narrow-aisle electric truck is manufactured by The Raymond Corporation, Greene, N.Y.)
7057 on Reader Service Slip.

There's a storehouse of information offered in technical literature. See the listing in this issue beginning on 119.


# STEPHENS-ADAMSON

EXCLUSIVE

"ZIPPER"* CLOSED-BELT CONVEYOR-ELEVATORS



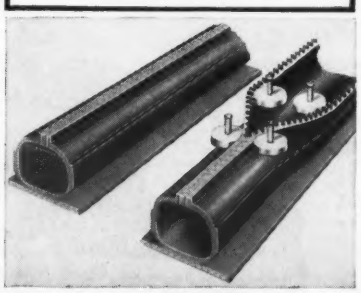

**LOADING AND UNLOADING CYCLE OF "ZIPPER" CONVEYOR**




1. Sidewalls brought into vertical position and ready for loading.

2. Flexible tube completely closed for conveying and elevating.

3. Rubber ZIPPER belt open for discharge, cleaning and return run.



Upper left unit closed and loaded. Lower right shows how belt is opened and closed by system of ball bearing rollers. (Rollers are mounted on a rigid framework)

**CONVEYS AND ELEVATES BY CONTINUALLY WRAPPING MATERIAL IN A PACKAGE... MOVING THE PACKAGE AND ITS CONTENTS TO A NEW LOCATION AND GENTLY UNWRAPPING IT!**

Literally a moving material-carrying conduit, the ZIPPER Conveyor is capable of transporting bulk materials in any plane, to considerable heights and around obstructions. Its great advantage is that bulk materials may be conveyed within the belt completely sealed and dust-tight. Material doesn't slide, isn't scooped, pushed or thrown but is gently carried over great distances without breakage, agitation or segregation. The ZIPPER Conveyor-Elevator provides versatility of layout and profitable material handling advantages you won't want to overlook.

*PATENTED

**WRITE FOR BULLETIN 349**

S-A

**ENGINEERING DIVISION**
**STEPHENS-ADAMSON MFG. CO.**
GENERAL OFFICE & MAIN PLANT, 17 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO

7058 on Reader Service Slip.

*"We've got the space, but money's awfully tight right now"*

*Free capital! Lease trucks from Hertz!*

# NO INVESTMENT...NO UPKEEP

Turn the capital you have invested in company-owned trucks into new facilities, new equipment or increased inventory. Switch to Hertz Truck Lease Service and release your money. You get new GMC, Chevrolet or other sturdy trucks, custom-engineered to fit your needs. Or we'll buy your present trucks, rebuild them if necessary, and lease them back to you. Furthermore, Hertz provides extra trucks for peak periods or emergencies.

Hertz experts take over all repairs and upkeep. You eliminate all your truck problems by writing one budgetable check per week. There's no easier way to get out of the truck business and back into your own business! Rely on Hertz, America's No. 1 truck lessor, with over 500 stations in the U. S. and Canada.

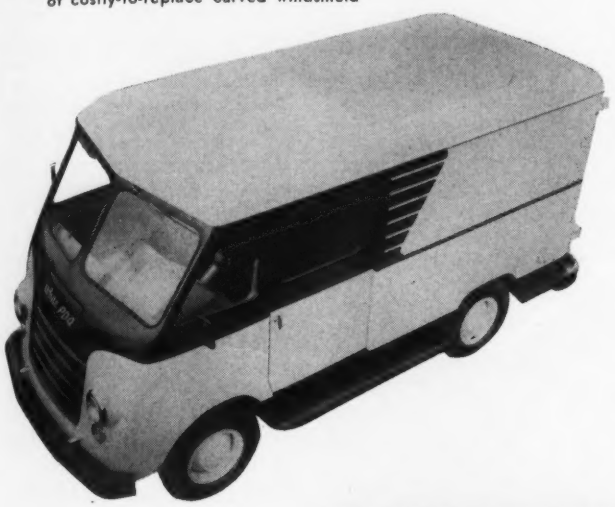
HERTZ TRUCK LEASE

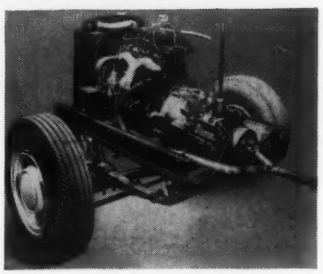
*For more information, call your local Hertz office. Or write for the fact-filled booklet, "How to Get Out of the Truck Business," to Hertz Truck Lease, Dept.* N 4, *218 S. Wabash, Chicago 4, Illinois.*

In addition, Hertz also rents trucks by the hour, day or week

For more information on product at left, circle 7059 see information request blank opposite last page.

Designed for utility, minimum maintenance and low-cost replacement, trucks employ such practical components as flat, two-piece windshield instead of costly-to-replace curved windshield





Dolly-mounted power assembly is rolled into place or removed from truck as a unit

**first delivery trucks to offer as standard features . . .**

- **'Roll-out' front-end power assembly**
- **Unitized body construction**
- **Fiberglass roof with integral 'skylight'**

NEW PDQ (for Pickup and Deliver Quickly) line of trucks introduced by one of country's well-known heavy-duty truck manufacturers is claimed to be first in the multi-stop delivery field to offer as *standard* such major operational and functional advantages as:

**Removable power dolly.** For major repairs or overhauls, entire front-end power assembly can be removed and replaced in less than three hr — less time than ordinarily required to remove and replace a transmission alone.

Removable power dolly on which are mounted front axle, springs, shackles, brackets, motor, transmission and clutch is disconnected by unfastening four bolts.

After truck body is hoisted up, power dolly is pulled out from under, and new power dolly pushed in and connected up.

This unique feature pro-


# NIAGARA "no frost"

**YOUR REFRIGERATION . . . fully automatic**

● You have continuous line production, the quickest freezing of raw or cooked food by the Niagara air method, always holding the highest quality. Niagara "No-Frost" makes your refrigeration fully automatic with uniform temperature and ALWAYS full capacity, with none lost by the icing of cooler coils. You have always a clean, sweet freezer or cold room. You save labor and your upkeep cost is the lowest. You get full capacity refrigeration from your plant at the lowest power cost.

*Write for Bulletin No. 105*

**NIAGARA BLOWER COMPANY**

**Dept. FP-4, 405 Lexington Ave., New York 17, N. Y.**

*District Engineers in Principal Cities*

7060 on Reader Service Slip.

for FREE demonstration or literature address:
**WEST CHEMICAL PRODUCTS INC.**, 42-22 West St., Long Island City 1, N. Y.
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

7061 on Reader Service Slip.

Three of 26 FMC Sweet Corn Harvesters at work cutting costs for Illinois Canning Company and their growers.

**One FMC Harvester replaces up to 15 hand pickers—cuts picking costs up to 57%!**

No wonder the FMC Sweet Corn Harvester is first choice among canners, growers and operators alike! Savings in picking costs alone quickly pay for these rugged, efficient units, with one FMC Harvester replacing 10 to 15 hand pickers for a reduction of up to 57% in costs! There's a 10% bonus in increased cut-off weight, too—up to 10% more yield per ton over hand picked corn.

**Works day or night**...lets you pick 'round the clock—when you, the corn, and your plant are ready. Picking delays and interruptions common to hand picking operations downgrade product quality and disrupt plant schedules. That's why each season finds more growers switching to FMC Sweet Corn Harvesters—always dependable, always on the job when there's picking to be done.

**Broad flexibility and adaptability.** The FMC Harvester is the *only* machine specifically designed for sweet corn harvesting. It can be mounted on practically all types and models of tractors, is extremely simple to operate, with all controls convenient to the driver. Its trouble-free dependability has been proved season after season, under all conditions—in heat, dust, rain, rough fields—in night and day operation.

**Now is the time to plan** for smoother, more profitable plant scheduling. So plan ahead with FMC Harvesters for consistently higher yields this season at lower costs.

*Putting Ideas to Work*

FOOD MACHINERY AND CHEMICAL CORPORATION
**Canning Machinery Division**
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

7062 on Reader Service Slip.




vides the benefits of spare trucks at half the cost — in effect substituting a dolly-mounted power unit for a complete truck.

(For routine maintenance and minor repairs, engine and components are easily reached simply by removing covers of forward section inside truck's cab.)

**Unitized construction.** For maximum strength and rigidity, all body structural elements are welded into an integral whole, and chassis components are mounted to underside of body structure.

**Roof with integral skylight.** Fiberglass roof with integral translucent skylight provides diffused daylight in the truck's load space without danger of water leakage.

**Other features.** Standard engines are special adaptations of the economical Willys Jeep F-head, four-cylinder engines, developing 70 hp — with 111-hp, six-cylinder engine optional.

Engine, heavy-duty 1½-in. clutch and Warner T87E heavy-duty transmission are matched, assembled and balanced together before being mounted on the power dolly.

Side panels, either steel or fiberglass (optional) and fiberglass roof assembly can be removed as units for quick replacement if necessary, with riveted or bolted construction eliminating torch cutting and welding.

All PDQ models have a single low step (either 13 or 14 in.), full cross aisle and swivel seat for quick in-and-out and reduction of fatigue in multi-stop deliveries. Step is a full three in. lower than in other standard-model delivery trucks.

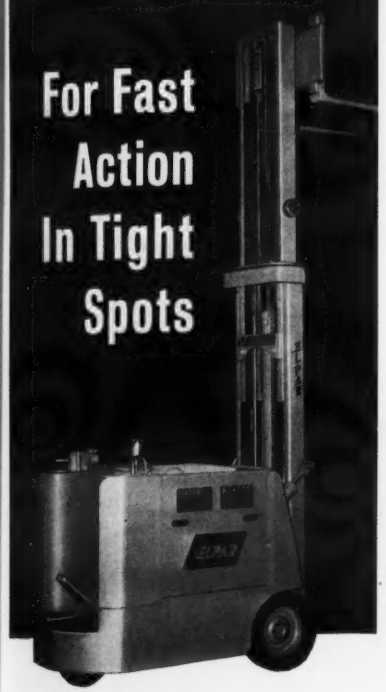
Two initial PDQ series include five models, with gross vehicle weights of 5000 to 7000 lb, and load weight capacities from 1500 to 3000 lb.

"A" Series models come in 190 and 207 cu ft capacities, respectively, while the three "B" Series models range from 232 to 378 cu ft.

Lengths vary from 179⅞ in. to 240⅞ in., with wheelbase range of 96 in. to 137 in. All

# ELPAR "Cargo Scout"

## For Fast Action In Tight Spots



**■ SHORT TURNING**
Short wheelbase, rounded rear corners and 180° turning angle of ELPAR's "Cargo-Scout" assure maximum maneuverability in narrow aisles, crowded docks and other confined spaces!

**■ HIGH SPEED**
ELPAR's high speed lift and travel plus fast acceleration assure more work in less time.

**■ SAFETY**
The stand-up operator's position on the ELPAR "Cargo-Scout" means he can get off fast in emergencies. Duplicate hand and foot controls make it easy to drive this truck backward when bulky loads limit forward vision.

***4 models - 2, 3, 4, & 5,000 lbs.***

*Write For Descriptive Catalog — Specify capacity required.*

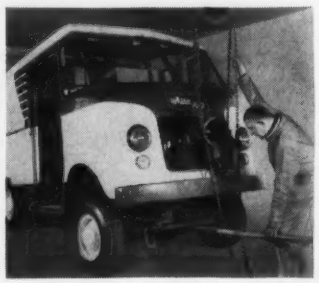
ELPAR ELECTRIC TRUCKS

**The ELWELL-PARKER Electric Company**

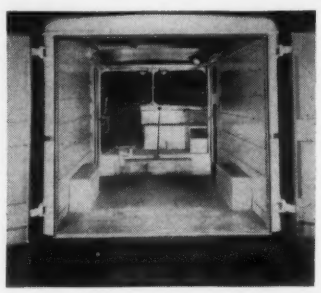
4003 St. Clair Avenue, Cleveland 3, Ohio

7063 on Reader Service Slip.


models feature exceptionally short turning radii.



One man can remove a power dolly and replace with another in less than three hr



Trucks are designed for parallel loading, with square body sides, square wheel houses and recessed-side doors

Five additional models, with gross vehicle weights ranging to 16,000 lb, will be added later in 1960.

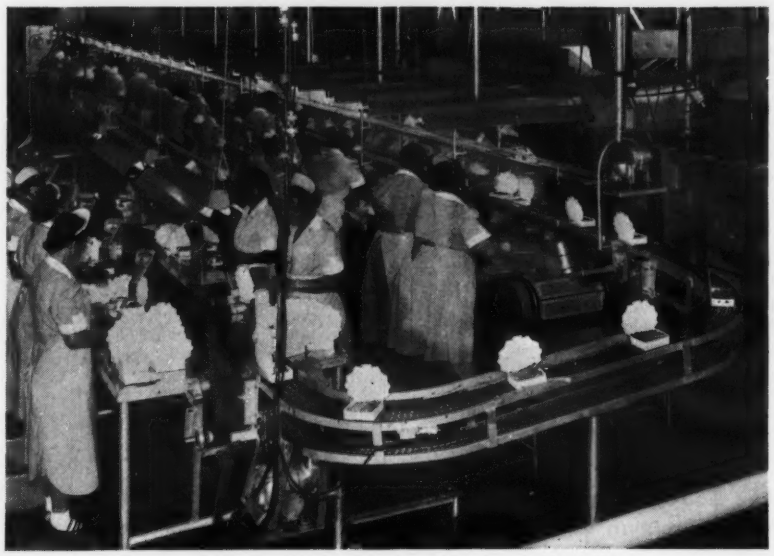
Options on various chassis components, as well as body options on rear door, partition, shelving, refrigeration and other special distribution requirements are available on all models, and expand the new line beyond the basic units announced.

(White PDQ line of multi-stop delivery trucks is manufactured by White PDQ Division, The White Motor Company, Montpelier, Ohio.
7064 on Reader Service Slip.

**Additional information quickly!** Use the convenient Reader Service Slip, found opposite the back inside cover, to secure additional information for application to your problem.


# ASHWORTH METAL PROCESS BELTS

## ...Carry The Load in Continuous Food Processing!



This patented ASHWORTH Omniflex Belt carries frozen asparagus around corners *and* on the straight-away . . . with NO transfers . . . *What's Your Product?*

Whether it is baking, deep frying, quick-freezing, cooling or any other process operation, you can keep your product on the move better with a belt designed to do the specific job . . . for instance, when the product is carried directly on the belt, either type 304 or type 316 stainless steel can be furnished.

Where analysis of service requirements indicate special design for particular application, Ashworth Field Representatives are trained and qualified to develop the information necessary to enable Ashworth Engineers to "job engineer" the correct belt for that job. Longer life, lower maintenance and proper performance under the most exacting conditions are the qualities you can depend on . . . when you specify Metal Process Belts by ASHWORTH BROS., INC.

*Illustrated literature available, write:*

**ASHWORTH BROS., Inc., Winchester, Virginia**

**Sales Engineers:** Atlanta, Berkeley, Calif., Birmingham, Ala., Charlotte, N. C., Chicago, Cincinnati, Cleveland, Dallas, Danvers, Mass., Detroit, Greenville, S. C., Houston, Long Beach, Calif., New York, Philadelphia, Pittsburgh, Rochester, St. Louis, St. Paul, Tampa, Tonawanda, N. Y., Canada: Montreal, Toronto, Mexico

7065 on Reader Service Slip.

### Carloading procedures for floating, anchored loads

Designed to assist shipping room and loading dock personnel in proper way to clean, drape, strap and load boxcars, freight carloading check charts provide clear, simple illustrated instructions on procedures for these types of loads.

(Carloading check chart for wall-anchored loads is offered by Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.)
7066 on Reader Service Slip.

(Carloading check chart for free-floating and controlled floating loads is offered by Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.)
7067 on Reader Service Slip.

### See $830 savings/unit with aluminum truck body

Cain's Coffee Company, Oklahoma City — a major Southwest-area processor and distributor of coffee and spices — expects to realize a savings of $830 per unit over the life

Aluminum bodies reflect heat; in summer can be up to 30 degrees cooler than painted steel

span of the truck bodies in their 48-unit over-the-road delivery fleet.

Largest single savings factor should be reduced painting expense. In past, with steel bodies, a complete paint job, including signs and decals, was needed four times over the 10-yr life of the body. This totaled $640.

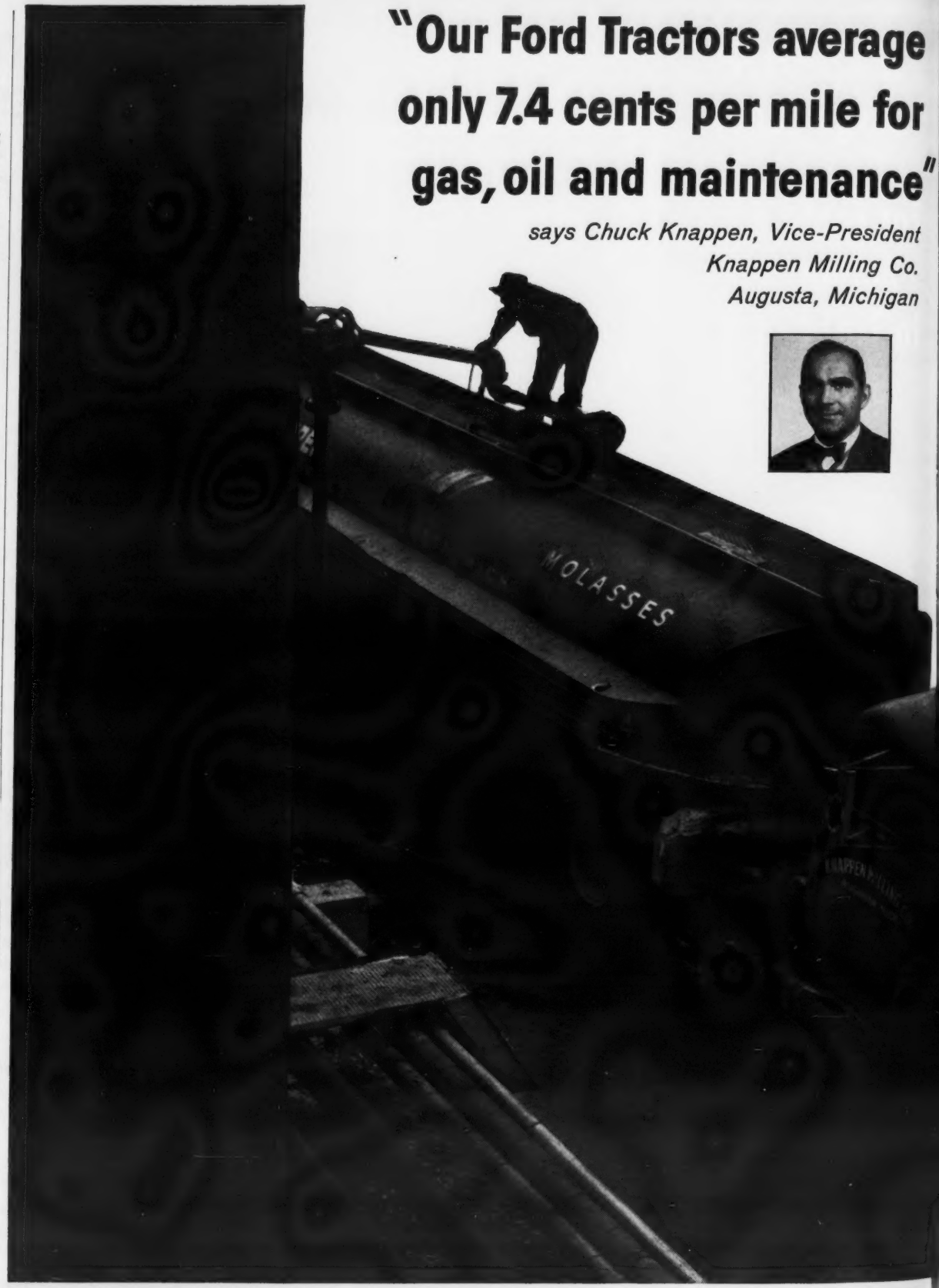
Now, estimates are that touch-up on the signs and added decals will cost only $60 for the over-all operating period — a saving of $580 per body.

Lighter body weight will al-


## "Our Ford Tractors average only 7.4 cents per mile for gas, oil and maintenance"

*says Chuck Knappen, Vice-President*
*Knappen Milling Co.*
*Augusta, Michigan*

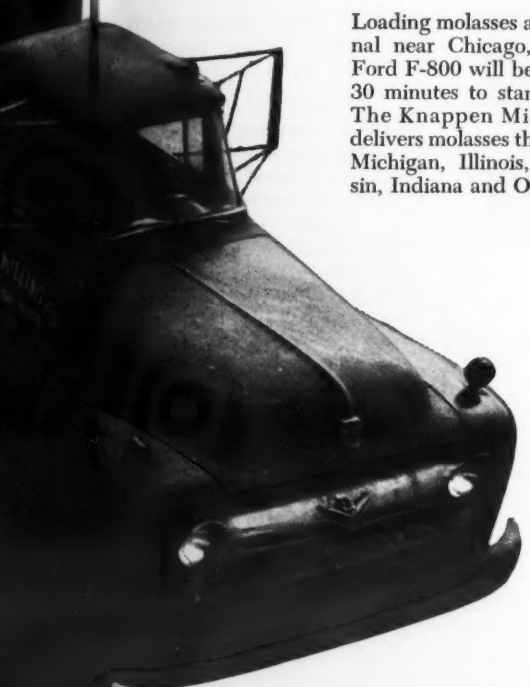




"We have seven Ford F-800 and F-850 tractors on molasses runs. And our latest 10-month operating figures show that this fleet went over 456,000 miles at an average per-mile cost of only 5.26 cents for gasoline and oil, and 2.14 cents for maintenance . . . a total of 7.4 cents per mile.

"We feel that this figure is very low because it includes a great deal of engine time that's not shown on the speedometer. All the power to pump the molasses from our tank trailers comes from a P.T.O. mounted on the tractor.

"Our drivers seem to like and take best care of our Ford Trucks. And we like Ford's low initial price, generous payloads and the fact they cost us less to operate. We put about 80,000 miles per year on a tractor with two drivers running up to 20 hours per day. We have '55 Fords on which the speedometer has turned over three times . . . and the trucks are still going strong!"



Loading molasses at a terminal near Chicago, this '56 Ford F-800 will be ready in 30 minutes to start its run. The Knappen Milling Co. delivers molasses throughout Michigan, Illinois, Wisconsin, Indiana and Ohio.

*Again in '60*

**FORD TRUCKS**

*offer Certified Savings!*

CERTIFIED FORD TRUCKS 1960 PROOF

**CERTIFIED ECONOMY . . .**

Yes, this year, if you buy a Ford Truck, you get a truck with certified economy in the three major expense items: gasoline, tires and initial price.

**Best Gas Mileage!** Results of second running of Economy Showdown U.S.A., show 1960 Ford ½-ton Pickups won every test—beat the average of other four leading makes by 13.1%.

**Double Tire Life!** Under average conditions, Ford's truck-type suspension gives double the front tire life of that obtained with "soft-type" independent suspension used on some 1960 trucks.

**Lowest Prices!*** New 1960 Ford ½-tonners are priced from $33 to $181 below those of leading competitive makes. List prices of Ford Light and Medium Duty models are lowest in their class.

**CERTIFIED DURABILITY . . .**

The refinements built into the '60 Ford Heavy and Super Duty Trucks for longer life and greater reliability will also bring savings to your operation.

**Automatic Radiator Shutters,** standard on all Super Duty models, add considerably to engine life. Reduction of coolant temperature variations from a 79° range to a 20° range means less expansion and contraction, more efficient combustion and better lubrication.

**Dynamometer Tests** of Ford's submerged-type electric fuel pump showed no vapor lock at temperatures up to 200° F. Incipient vapor lock with mechanical fuel pump resulted in a 9% power loss under the same conditions.

**Shaker Table Tests** plus constant exposure to oil, water and heat proved Ford's 1960 wiring harness to be three times longer lived than the 1959 harness.

**CERTIFIED ECONOMY REPORTS . . .**

Certified results of these and other tests conducted by America's leading automotive research organization, plus a comparison of manufacturers' suggested list prices, are now available at your Ford Dealer's. Take him up on his offer to check the records . . . see and drive the new Ford Trucks . . . *and you'll save for sure!*

**Based on latest available manufacturers' suggested retail prices, including Federal excise tax, excluding dealer preparation and conditioning and destination charges*

**FORD TRUCKS COST LESS**

*LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!*

7068 on Reader Service Slip.

low purchase of less costly licenses, providing a savings of $25 per yr, or $250 over the 10-yr period. It also should provide as yet undetermined savings in less gasoline used and less strain on the truck.

(Aluminum delivery van bodies are manufactured by American Body and Trailer Company, 1500 Exchange, Oklahoma City, Okla.)
7069 on Reader Service Slip.

### Highway transportation legislation in 1959

Summary of Federal and State activity is made available as service to highway users, to whom a single new law or regulation can make the difference between profit and loss.

Booklet's principal sections deal with "highway taxation and finance," "highway laws" and "uniform laws and motor vehicle regulation."

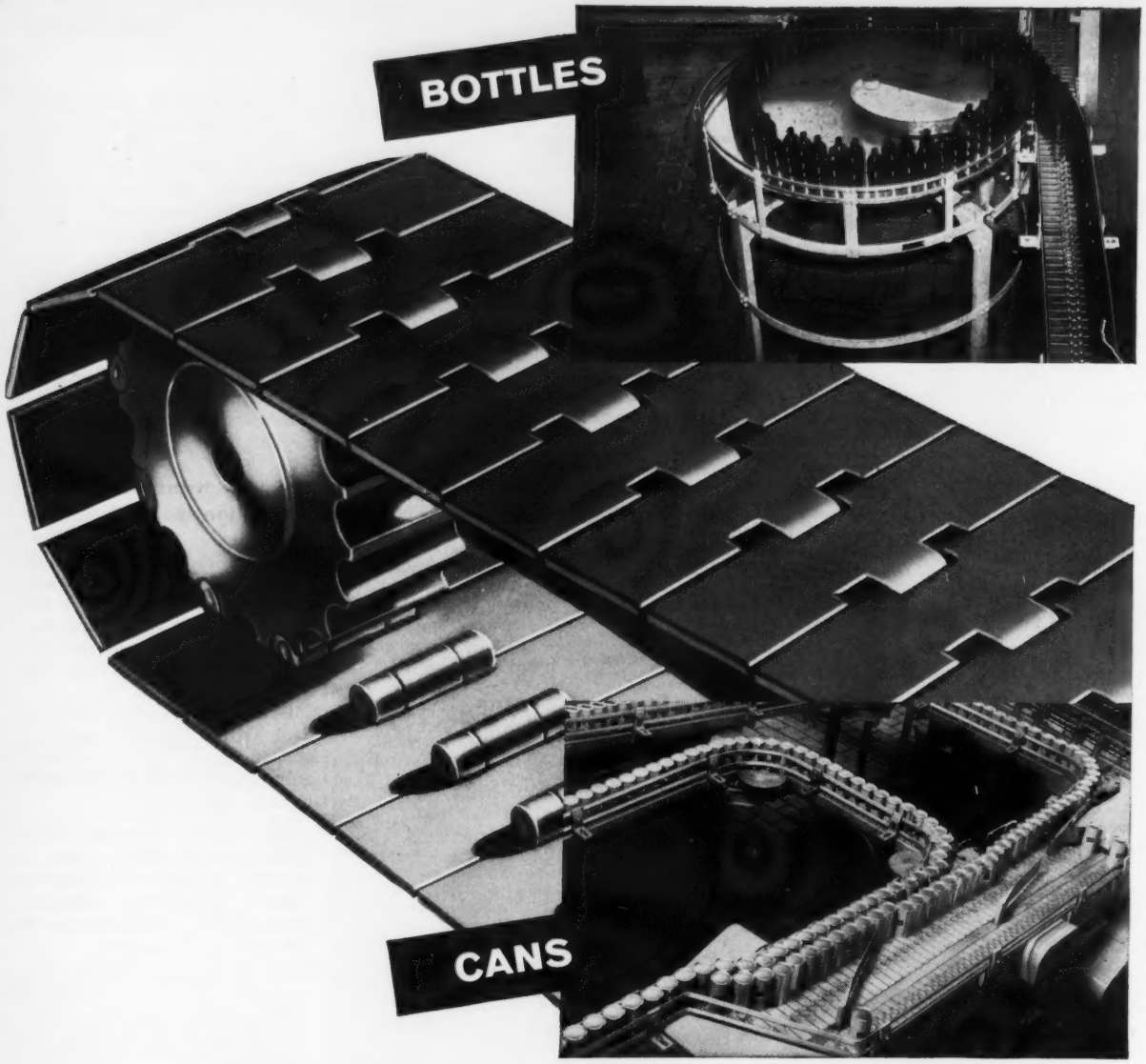
("Highway Transportation Legislation in 1959," 22 pp, is offered by National Highway Users Conference, National Press Bldg., Washington 4, District of Columbia.
7070 on Reader Service Slip.

### Car spotter goes anywhere on rail or road

Quick-reading, fully illustrated booklet shows how, in one minute, versatile vehicle is a truck running on rubber tires on the road, and next it rolls across a railroad track, drops a separate set of wheels down on the rails, and is ready to take on freight-car handling.

"Trackmobile" switches, spots and hauls railroad cars, in its spare time doubles as a snow plow or materials handling truck.

("Make Freight Car Handling Your New 'Economy Zone'", Bul T-131, 32-pp, pocket-size booklet, is offered by Whiting Corp., 157 & Lathrop Ave., Harvey, Ill.)
7071 on Reader Service Slip.




# Rex TableTop® is your top choice

**FOR SMOOTH CONVEYING.** TableTop provides a smooth, level carrying surface that assures steady, tip-free conveying. Top edges of links are coined... accurately beveled. Minimum gap between links in operation, or flexing over sprockets, prevents tipping, tearing or damaging conveyed units.

**FOR SIMPLICITY.** TableTop is simplicity itself... just a one-piece link and a pin. No attachments... no need for elaborate troughs. Yet, TableTop is manufactured as accurately as a fine watch.

**FOR CLEANLINESS.** TableTop stays cleaner... is the easiest to clean. Smooth, simple design eliminates "pockets" where foreign matter can build up.

**FOR ECONOMY.** Rex (the original) high carbon or stainless steel, TableTop Chain sssures longest life, minimum wear... load for load... job for job! Wide chain bearing area with wide sprocket teeth stabilizes chain... reduces bearing pressure on sprocket teeth. Thousands of cost-saving applications prove TableTop is your *top* choice.

**FOR INFORMATION.** Call your Rex CHAIN Belt Distributor or write CHAIN Belt Company, 4699 W. Greenfield Ave., Milwaukee 1, Wis.

REX®
CHAIN BELT COMPANY

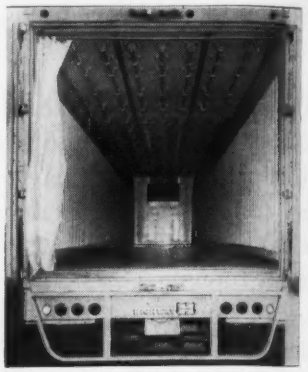
7072 on Reader Service Slip.




## Stainless hangers keep chips off meat in transit

Up to 20 tons of steaks "just off the hoof" are kept clean and sanitary with help of 1¾-in. stainless steel tubing anchored to trailer ceiling and used for hanging meat in reefer-type trailers.

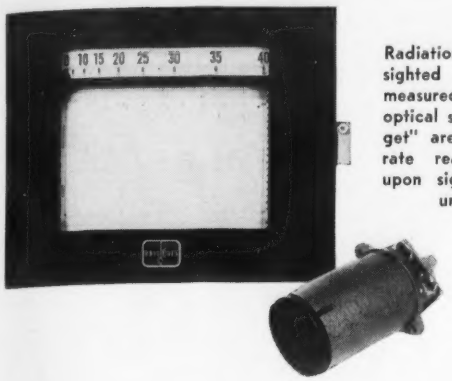
Stainless hangers were substituted for previously used softer or plated metals, which were found to chip, resulting in metal particles falling on the meat.



More than 240 ft of stainless steel tubing goes into special hangers

(Welded stainless steel tubing, manufactured by The Wallingford Steel Co., a subsidiary of Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa., is used in reefer-type trailers manufactured by Highway Trailer Co., Edgerton, Wis.)
7073 on Reader Service Slip.

"Mind opening up a bottle for me? . . . . I'd like to propose a fare-well toast!"



Radiation pyrometer unit is sighted on surface to be measured by use of integral optical system. Minimum "target" area required for accurate reading is dependent upon sighting distance from unit—see article

# Read temperatures from 0 to 600 F without physical contact

***Low-range radiation pyrometer system has:***

- **direct-reading chart and scale;**
- **automatic ambient temperature compensation;**
- **reproducibility: ±0.6 F on 0-60 F scale**

By FP Staff

Heretofore, industrial use of radiation pyrometers was limited primarily to applications in which temperature ranges were upward of 1000 F. New low-temperature range instrument makes possible the application of radiation pyrometers to ordinary temperature-measuring problems in the food industry.

As is the case with high-temperature radiation pyrometers, temperature measurements are made without contacting the surface. Temperature is measured by sensing the amount of thermal radiation the material emits which is a direct function of its temperature.

Radiation pyrometers, when aimed at a material, collect and focus energy waves on a thermopile. This thermopile is a group of tiny thermocouples arranged in series so as to secure a relatively high voltage for a small temperature difference.

In the thermopile circuit are temperature-sensitive resistors which automatically compensate for variations in ambient temperature up to 135 F.

Voltage generated by thermopile is transmitted to indicator shown in photo. A potentiometer in this indicator transforms the voltage into a temperature reading.

**Reproducibility** of instrument is plus or minus 1 per cent of full scale range.

Three double-scale ranges are available as follows: 0-30 F (0-300 F), 0-40 F (0-400 F) and 0-60 F (0-600 F).

Speed of response is 3 seconds to final value.

**Target area:** For accurate reading, a definite minimum target area is necessary, depending upon distance from pyrometer to target. For example, at 1 ft distance, minimum target diameter must be 4.4 in.; at 5 ft distance it must be 9.7 in. and at 10 ft it must be 16.3 in.

Minimum target diameter (Y) as a function of sighting distance (X), from front edge

NEPTUNE

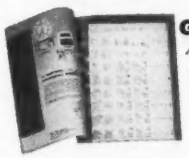
"Meter with a memory"

FILLS A BARREL A MINUTE

A 55-gal. drum every minute filled accurately with no spillage... that's the high speed this "meter with a memory" makes possible for Dynamic Industrial Products Corporation. It's Neptune's Repeating Auto-Stop Meter. Set the meter *once*, and it delivers the same quantity accurately every time the valve is opened. It shuts off automatically, right on the nose. Takes only a few seconds to reset to a different quantity.

To fill at this high rate without foaming or splashing, an aluminum tube with a quick-connect fitting is inserted into each barrel in turn. While one barrel is filling, the operator caps the barrel ahead of it and pre-positions the empty one behind it.

Neptune meters now handle hundreds of solvents, chemicals, and food ingredients. Capacities 2 to 1000 gpm. Optional features: automatic ticket printers; explosion-proof Auto-Switch for control of pumps, valves, etc.; remote control systems. Stainless steel meters also available.



GET THE FACTS

*Ask for helpful Meter Data Bulletin 566 DFP See Neptune Data Pages in Chemical Engineering Catalog.*

neptune

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NEPTUNE METER COMPANY
19 West 50th Street • New York 20, N.Y.

7074 on Reader Service Slip.

of pyrometer unit to target, is given by the equation $Y = 3.11 + 0.11X$.

**Emissivity correction:** Use of radiation pyrometer to measure temperature is based on the relationship between temperature and radiation under "black body" conditions.

A "black body" is any object which is capable of acting as either a perfect absorber or radiator of energy at all wave lengths. Such an object is said to have an emissivity of 1.0.

Objects that are less than 100 per cent efficient as radiators or absorbers have emissivities that are proportionately less than one.

If the emissivity of the object whose temperature is being measured is less than one, a correction must be applied to the radiation measurement to secure the correct temperature.

Fortunately, practically all materials except metals have an emissivity of 1.0 in the high infra-red band for which these low temperature radiation pyrometers are designed. For measurement of materials where the emissivity is less than one, a correction is made by simply turning a knob on the instrument.

Tables of emissivities are available for various materials. When necessary, the emissivity can be determined by a procedure which amounts to calibrating the instrument.

(Bristol-Velotron Model 9E6 low-range, radiation pyrometer system is a product of The Bristol Company, 143 Bristol Road, Waterbury 20, Conn.)
7075 on Reader Service Slip.

### Measures density, gravity or levels without contact

No contact with liquid is necessary when using radiation instrument to measure density or liquid level.

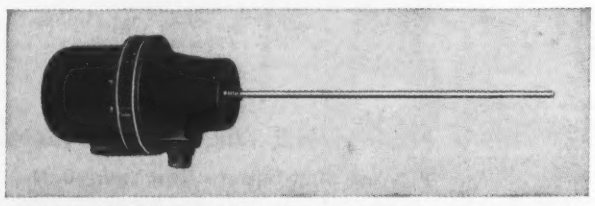
Source of gamma radiation, shielded for safety, is arranged so that its energy passes through pipe or vessel containing liquid or slurry to


**Better products, more profit...**

# AUTOMATICALLY

**with a HONEYWELL MOISTURE CONTROL SYSTEM**

**ROLLER TYPE SENSING ELEMENT** is used to measure the moisture content of sheet materials. Segmented rollers are available for moisture profiles. When properly insulated, idler rollers on a machine can be used for measuring the average moisture content of sheet materials.



**PROBE TYPE SENSING ELEMENT** is used to measure the moisture content of granular materials.

**THE HONEYWELL *MOIST-O-GRAPH* HAS BEEN TESTED AND PROVED WITH THESE MATERIALS:**

POTATO SHEET
COTTONSEED
TOBACCO SHEET
FLOUR
OAT BITS
ALFALFA
OAT FLAKES
CASTOR BEAN
PEANUT MEAL
DRIED BEET BULB
BARLEY AND OATS GRASS
LIMA BEAN VINES
LINSEED MEAL
POTATO STARCH
PEARL STARCH

**HONEYWELL *MOIST-O-GRAPH*** measures moisture content from approximately 5% to 30% by resistance measurement, with a range of 0-100,000 megohms.

Automation makes any process pay extra dividends in productivity, product improvement and profit. One of the many ways Honeywell can bring you the advantages of automation is through precise, automatic control of moisture in granular and sheet materials.

The Honeywell *Moist-O-Graph* system gives you positive quality control, and lets you maintain a profitable moisture balance in your products. It gives you a continuous, permanent record of moisture content. It leads the way to tangible savings in your drying operations, and lets you use your manpower more productively. Presently installed *Moist-O-Graph* systems have paid for themselves in six months.

Let Honeywell survey your process for best possible application of the *Moist-O-Graph* system. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

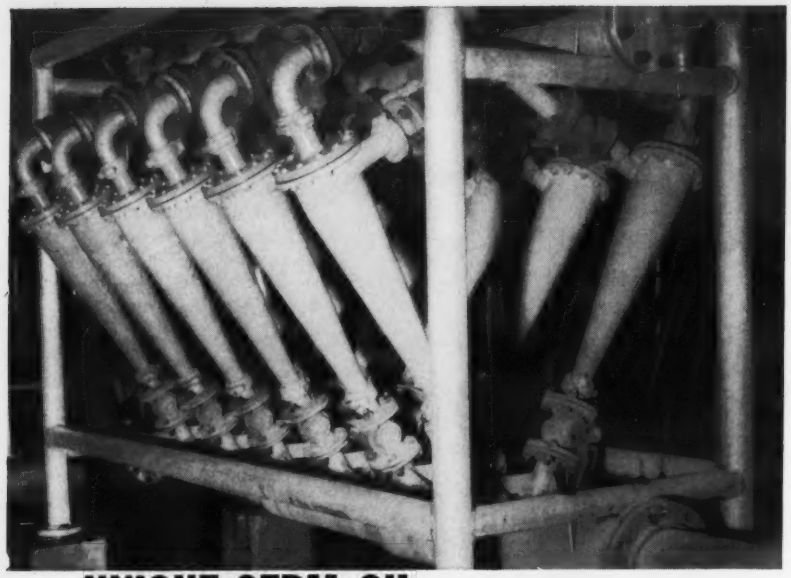
MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

75th YEAR
PIONEERING THE FUTURE

**Honeywell**

H HONEYWELL *First in Control*
SINCE 1885

7076 on Reader Service Slip.



# UNIQUE GERM-OIL SEPARATION SYSTEM USES MOLDED PLASTIC DORRCLONES *at Union Starch and Refining Co., Inc.*

A complete germ-oil separation system – the first of its kind – processes 1100 gpm of steeped corn slurry at the corn wet milling plant of Union Starch and Refining Company, Inc., Granite City, Ill.

The unique feature of the installation is its use of DorrClone wet cyclone separators made of molded plastic. The system comprises 18 6″ dia. DorrClones, arranged for 2-stage separation. Overflow from the first stage of 12 units (shown above) is recycled to the second stage of 6 units, giving maximum germ-oil recovery.

Plastic construction makes possible sanitary, low cost equipment. Only the headers are of expensive stainless steel. Added to this are the basic advantages of wet cyclone operation – efficient separation by centrifugal force, no moving parts, ease of control and continuous, high capacity processing with the minimum of attention. Wide opportunities exist for other cost-saving applications of molded plastic DorrClones throughout the food processing industry. For further information, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

*DorrClone—T.M. Reg. U.S. Pat. Off.*

DORR-OLIVER
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

7077 on Reader Service Slip.

be measured.

Amount or radiation energy reaching electric receiving cell is a function of density or level of material in pipe or tank. Receiving cell converts radiation energy directly into electrical energy which is thus proportional to material density.

Output signal is amplified and fed to recorder-controller that actuates any desired control to bring process back to optimum density or level.

Measuring equipment and the process are detailed in six-page bulletin. Typical uses of instrument, such as liquid level gages, interface detection gages and controlling specific gravity are described and illustrated.

Table included lists range and pipe sizes.

("Ohmart Basic Systems Data," Bulletin 105-C, is available from The Ohmart Corporation, 2236 Bogen St., Cincinnati 22, Ohio.)
7078 on Reader Service Slip.

### Control wastes . . . by instrumentation

Bulletin, 28 pages long, is a compilation of articles that have appeared on subject of waste-treatment problems. It presents a series of case histories on how instruments are applied to industrial waste treatment systems to prevent stream pollution.

Articles are well illustrated with photographs and drawings. They are authored by technical operating personnel.

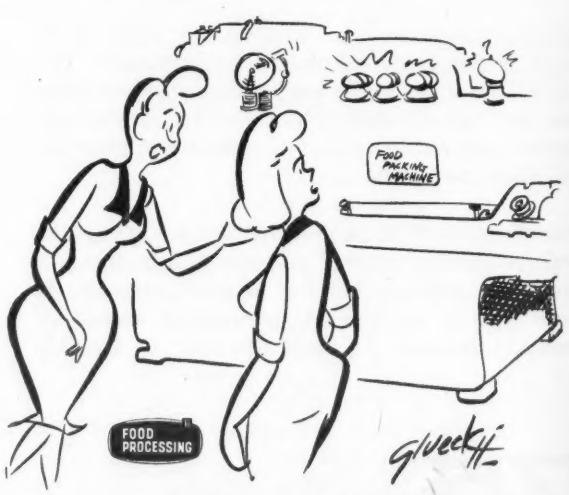
("Instrumentation for Treatment of Industrial Wastes," Bulletin B97-2, may be obtained from Minneapolis-Honeywell Regulator Company, Industrial Division, Wayne and Windrim Avenues, Philadelphia 44, Pa.)
7079 on Reader Service Slip.

### Automatically controls counting operations

**Uses:** For automatically controlling operations dependent on number of cans or bottles on conveyor lines.

**Features:** Knob-operated setting-hand determines number of cans or bottles that are counted (input revolutions) before control action occurs.

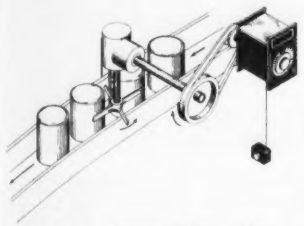
Clutch drive in counter makes automatic reset possible; setting need not be adjusted again till new control number is desired. Red pointer rotates toward zero to provide




"Four rings . . . 3 red lights, a flickering yellow one . . . I think it's trying to tell us something."

indication of cycle progress.

Shaft revolutions up to 1000 rpm can be counted and only 1¼ inch-ounces of torque are necessary for dependable operation. Repeatability is ± 0.0025 of dial range.



Counter is designed for surface or flush mounting

**Operation:** Input shaft transmits rotation to traveling dial pointer through electric clutch and totally-enclosed gear train. Latter reduces number of input revolutions on shaft to single turn representing full scale of dial.

**Description:** Counter is made for either AC or DC operation. It can be used with any one of eleven dial ranges, from 0 to 12 up to 240,000 revolutions. Counter is available in numerous circuit arrangements for wide adaptability.

(Atcotrol Series 307 Revolution Counter is a product of Automatic Timing & Controls, Inc., King of Prussia, Pa.)
7080 on Reader Service Slip.

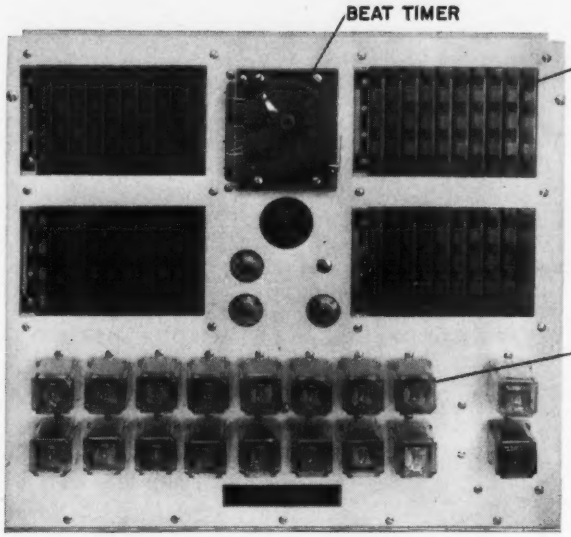
### Electronically indicates process variables

Electronic indicator, to be used with accessories, to indicate values of flow, liquid level, temperature, pressure, position, input motion, pH and several other variables is described in illustrated, 4-page specification sheet.

Either one of two electronic receiver units can be incorporated for operation with suitable transmitters — a differential transformer receiver, or a slidewire receiver.

("Model 721 Electronic Indicator", Specification Sheet 59-B721, may be obtained from The Hays Corporation, Michigan City, Ind.)
7081 on Reader Service Slip.


# New from Taylor for CIP Systems




## VALVE PULSING CONTROL PANEL

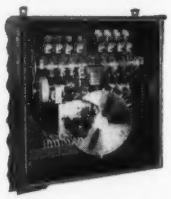
Insures effective cleaning of CIP Product Handling Valves and associated piping and processing equipment programming the cycling of the CIP Valves. Actuated by the timer on the CIP recirculation system, one Control Panel can program up to four completely independent circuits.

The Valve Pulsing Control Panel is simple, dependable, and highly adaptable. Programs can be varied without wiring changes. Step switch and relays plug in. Relays contain indicator lights. A jog switch permits simple checking of relays, external solenoid valves and CIP valves.

The panel is expandable—relays, 2 or 3 pole, can be added as plant needs change. All units include 16 relay sockets and wiring. It can be mounted in rear of a control panel, or in dust-tight control box.

## You also need these basic instruments...

**Taylor Valve Actuators** to operate your Cleaned-In-Place Product Handling Valves. Three standard types.



**FLEX-O-TIMER* Timed Program Controller** to provide for direct time settings of operation sequence through pneumatic and/or electric actuation.

**Taylor FULSCOPE* Controller** to insure precise control of circulated solution temperature at any desired value.

*If the engineering for your CIP System has been completed, your Taylor Field Engineer will be glad to specify the required instrumentation. If not, contact your preferred equipment supplier or source of cleaning chemicals... and be sure to specify "Taylor equipped as usual".*
*Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ont.*

*Reg. U.S. Pat. Off.

**Taylor Instruments MEAN ACCURACY FIRST**

7082 on Reader Service Slip.

# FLUIDICS* AT WORK

## How to evaporate "problem" products more efficiently

If you evaporate products that are (1) heat sensitive, or (2) highly viscous, or (3) low in thermal conductivity, take a look at the Pfaudler Wiped Film Evaporator.

What makes it so well suited to handling difficult evaporations is the *mechanically wiped evaporating surface.*

It works like this: Centrifugal force of an internal rotor (you can see it in the picture above) holds four free-floating wipers in contact with the evaporator wall.

**Thin uniform film.** These wipers spread your product over the entire evaporating surface in a *thin, uniform film.* Slots in each wiper prevent product "curl" forward of the wipers and accelerate product movement down and *off* the wall.

**Efficient heat transfer.** Since the heated wall is kept completely wet, you are sure of maximum heat transfer—from every square foot of surface—very important for high capacity with viscous and heat-sensitive materials, or those with low thermal conductivity.

**Test program.** In our Test Center we keep available a four-square-foot Wiped Film Evaporator for making evaluations.

When it comes to production units, you can select from units offering 4 to 100 square feet of evaporating area, or larger units by custom design. (That's a 50-square-foot one being assembled in the picture.)

For more information about testing your product, or a detailed specification sheet, write to our Pfaudler Division, Dept. FP-40, Rochester 3, N. Y. Thank you.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

**PFAUDLER PERMUTIT INC.**

Specialists in FLUIDICS . . . the science of fluid processes

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## technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Items followed by (†) indicate literature offered by advertisers. Key number in the last line will help locate these reviews, which are numbered in sequence.

### Processing Equipment, Accessories

**No foaming with air-tight centrifugals***, (Booklet) The De Laval Separator Company
6958 on Reader Service Slip.

**Mills wide variety of products***, 4 pp, (Brochure) The COG Corporation, Division of Motiograph, Inc.
6959 on Reader Service Slip.

**Rotating leaf pressure filters, designed for specific applications†**, (Detailed product information bul) Goslin-Birmingham
7084 on Reader Service Slip.

**A kettle for any mixing or cooking job†**, (Cat) Hamilton Copper and Brass Works
7085 on Reader Service Slip.

**Reviews line of refrigeration equipment and systems***, 36 pp, (Bul 80-F) Frick Company
6962 on Reader Service Slip.

**Integral unit blends and fills soft drinks***, 8 pp, (Brochure) Crown Cork & Seal Co., Inc.
6963 on Reader Service Slip.

**Fast, sanitary, low-cost cleaning and dewatering of food products†**, Link-Belt
7086 on Reader Service Slip.

**Corrosion resistant processing equipment†**, (Bulletins) Lee Metal Products Co., Inc.
7087 on Reader Service Slip.

**Stainless steel containers have seamless cupped bottom section†**, (Bull SS) Pressed Steel Tank Co.
7088 on Reader Service Slip.

**Uses of carbon dioxide in the meat industry***, 12 pp, (Form ADPC 43) Pure Carbonic Company, Division of Air Reduction Co., Inc.
6952 on Reader Service Slip.

**50 to 2000 gal glass-lined reactors,** 12 pp, (Bul 971) The Pfaudler Company
7089 on Reader Service Slip.

### Ingredients, Food Additives

**Over 700 flavor listings***, 28 pp, (Reference List No. 60) Ungerer & Company.
6974 on Reader Service Slip.

**Antibiotics for meat processing***, 44-page bulletin, (American Cyanamid)
6970 on Reader Service Slip.

**Greater yield, clearer juice with pectic enzymes†**, (Technical Lit) Rohm & Haas
7090 on Reader Service Slip.

**All types gums specially processed for the food industry†**, (Technical Bulletin) Meer Corporation
7091 on Reader Service Slip.

**Antioxidants for every application†**, (9 bulletins available on: Tenox—Eastman food—grade antioxidants; The Eastman family of Tenox food-grade antioxidants; Which antioxidants for your fat-containing foods?; Tenox antioxidants for more effective food packaging materials; Tenox antioxidants for edible animal fats; Effective stabilization of inedible animal fats with Tenox; Tenox feed-grade antioxidants for poultry and animal feeds; Tenox antioxidants for the fishing industry; and Mechanisms of fat oxidation) Eastman Chemical Products, Inc.
7092 on Reader Service Slip.

### Packaging, Labeling, Cartoning

**Printing on polyethylene film and molded containers***, 16 pp, U. S. Industrial Chemicals
6992 on Reader Service Slip.

**Selecting and handling molded plastic food containers***, 12 pp, Florsheim Mfg. Co.
6993 on Reader Service Slip.

**Superior multiwall-bag tape closures with hot-melt adhesive applicators***, 4 pp, United Shoe Machinery
7006 on Reader Service Slip.



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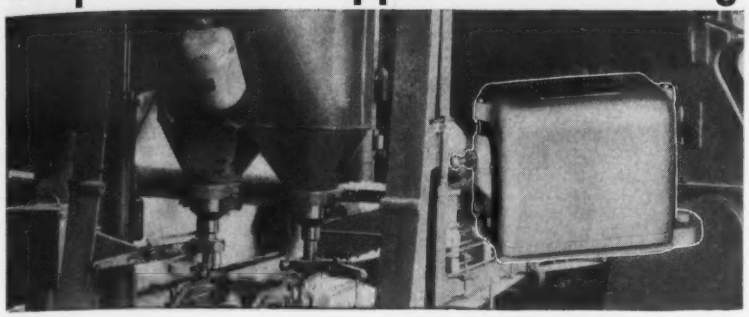

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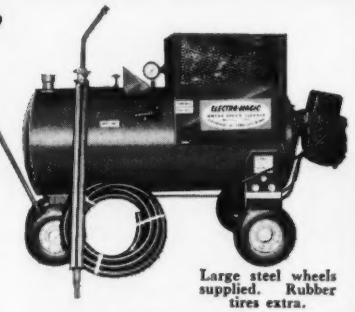

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**Automatic bag closing equipment†,** (Cat File) Dave Fischbein Co.
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**Machinery has versatility for varying package sizes†,** (Brochure) Bartelt Engineering Co.
7096 on Reader Service Slip.

**Directory of plastic packaging suppliers*,** 36 pp, Koppers Co.
6996 on Reader Service Slip.

**Heat-seal characteristics of polyethylene films and coated substrates*,** 16 pp, U. S. Industrial Chemicals
6998 on Reader Service Slip.

### Bulk Handling, Accessories

**Modern graphic control panels for material handling systems*,** 12 pp, (Bul G-9) Fuller Co.
7045 on Reader Service Slip.

**Practical and profitable pneumatic conveying for small bakery operations*,** 4 pp, (Bul I-66) Sprout, Waldron
7049 on Reader Service Slip.

**Permaglas storage unit†,** (Bul MU-100) A. O. Smith
7097 on Reader Service Slip.

**Selecting pneumatic conveying and bulk storage tanks†,** (Bul M-588, 12 pp on pneumatic conveying and Bul 574, 12 pp on storage tanks) The Day Company
7098 on Reader Service Slip.

**Stainless steel tubs, trucks, drums†,** (Cat. No. 60) Standard Casing Co.
7099 on Reader Service Slip.

### Conveyors, Racks, Accessories

**Outlines advantages of flexible steel conveyor belts†,** (Free Lit.) La Porte Mat & Mfg Co.
7100 on Reader Service Slip.

**Special treatment makes conveyor belts resistant to various materials†,** (Manual) Buffalo Weaving and Belting Co.
7101 on Reader Service Slip.

**Metal process conveying belts†,** (Illustrated Lit.) Ashworth Bros.
7102 on Reader Service Slip.

### Fork Trucks, Accessories

**Lease plans for industrial trucks*,** 24 pp, Elwell-Parker
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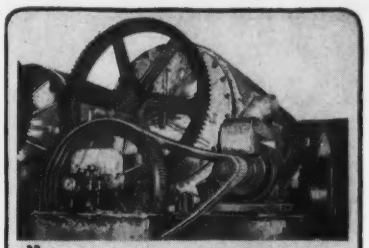
**Lift trucks for fast action in tight spots*,** (Cat) Elwell-Parker Electric Company
7103 on Reader Service Slip.



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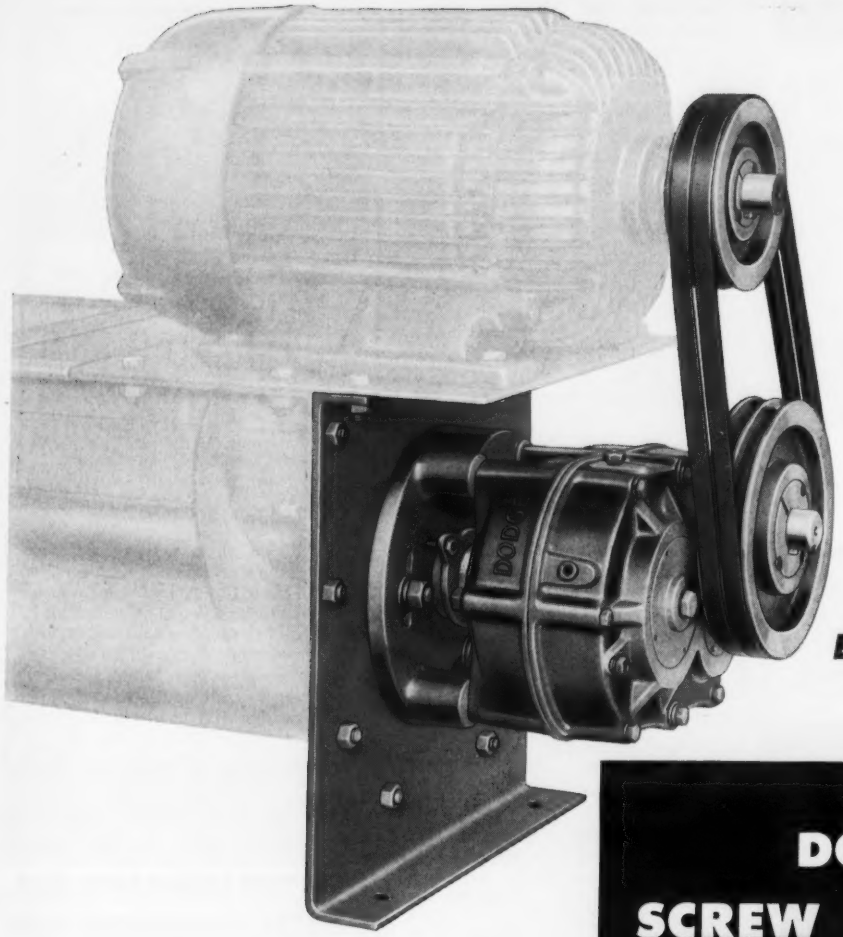

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***A complete package drive, including***

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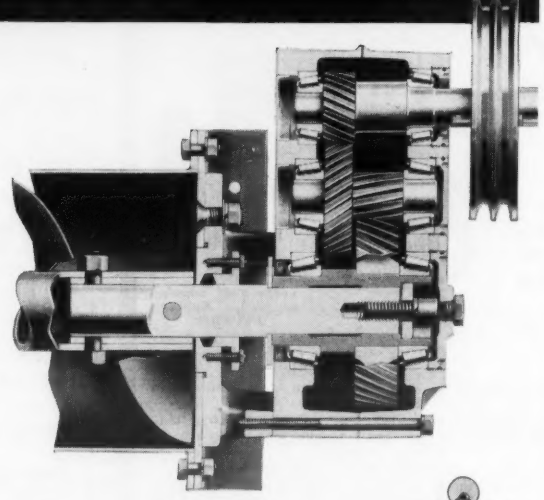

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## *new literature*

### Over-the-Road Trucks

**Summary of highway transportation legislation in 1959*,** 22 pp, National Highway Users Conference
7070 on Reader Service Slip.

**How to Get Out of the Truck Business†,** (Booklet) Hertz Truck Lease Dept.
7106 on Reader Service Slip.

### Controls, Regulators, Indicators

**Electronic indicator indicates values of several variables*,** 4 pp, (Spec Sheet 59-B721) Hays Corporation
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**Uses gamma radiation for measuring and controlling density, liquid level*,** 6 pp, (Bul 105-C) The Ohmart Corporation
7078 on Reader Service Slip.

**Controlling wastes in industry†,** 28 pp, (Bul B97-2) Minneapolis-Honeywell Regulator Co. Industrial Division
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**Select a control best suited to your operation†,** (14 bulletins available on: Time Switches, Program Clocks, Cycle Repeaters, Time Delay Relay, Auto-Lawn Sprinklers, Liquid Level, Milk Level, Nonconductive Liquid, Automatic Reset, Ice Thickness, Boiler Level, Motorized Sanitary Valves, Interval Timers and Photoelectronic Relays-Counters, etc.) Lumenite Electronic Co.
7107 on Reader Service Slip.

**Meters for handling solvents, chemicals and food ingredients at capacities from 2 to 1000 gpm†,** (Bul 566 DFP) Neptune Meter Co.
7108 on Reader Service Slip.

**Counters for every purpose†,** (Cat 51-55) Durant Mfg. Co.
7109 on Reader Service Slip.

### Sanitation

**Screw conveyor drive offers easy installation, high efficiency, low maintenance†,** (Bulletin) Dodge Manufacturing Corp.
7110 on Reader Service Slip.

**Stainless steel lavatory and related equipment†,** (Cat) St. John & Co.
7111 on Reader Service Slip.

**Materials for clean-in-place systems†,** (Bul F-9414) Oakite Products
7112 on Reader Service Slip.

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**railcar spotting**
**road*,** 32-pp
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**Solving waste-disposal problems†,** (Free Brochure) Dempster Brothers
7113 on Reader Service Slip.

**Sanitation programs and materials for equipment cleaning†,** (Sanitation Surveys) Klenzade Products, Inc.
7114 on Reader Service Slip.

### Maintenance

**Automatic chemical control for cooling towers and evaporative condensers*,** 6-page fold-out brochure, Erlen Products Co.
7013 on Reader Service Slip.

**Offers extensive line of roller chains and sprockets*,** 56 pp, (Bul A691) Dodge Mfg. Corp.
7030 on Reader Service Slip.

**Industrial wire cloth for every purpose†,** 94 pp, (Cat) The Cambridge Wire Cloth Co.
7115 on Reader Service Slip.

**The Modern Way to Design Multiple V-Belt Drives†,** (Booklet) The Gates Rubber Company
7116 on Reader Service Slip.

**Teflon Packings and Teflon-Jacketed gaskets†,** (Packing Cat AD-131 and Gasket Cat AD-154) Garlock Packing Co.
7117 on Reader Service Slip.

**Pressure-sensitive Teflon tapes for numerous applications†,** (Folder) Connecticut Hard Rubber
7118 on Reader Service Slip.

### Piping, Pumps, Valves, Accessories

**Help in solving corrosion problems with ductile cast iron pipe*,** 20 pp, James B. Clow & Sons, Inc.
7034 on Reader Service Slip.

**Positive displacement, heavy-duty pumps of stainless steel, monel, mild steel, and other alloy†,** (Cat MEP) Viking Pump Company
7119 on Reader Service Slip.

**Pump measures amounts of different fluids direct from original containers†,** (Idea Booklet) Gray Company, Inc.
7120 on Reader Service Slip.

### Miscellaneous

**Carloading check chart for wall-anchored loads*,** 1 p, (SPD 133), Signode Steel Strapping
7066 on Reader Service Slip.

**Carloading check chart for free-floating and controlled floating loads*,** 1 p, (SPD 240) Signode Steel Strapping
7067 on Reader Service Slip.

**Versatile vehicle for hauling or railcar spotting runs on rails or road*,** 32-pp booklet, (Bul T-131), Whiting Corp.
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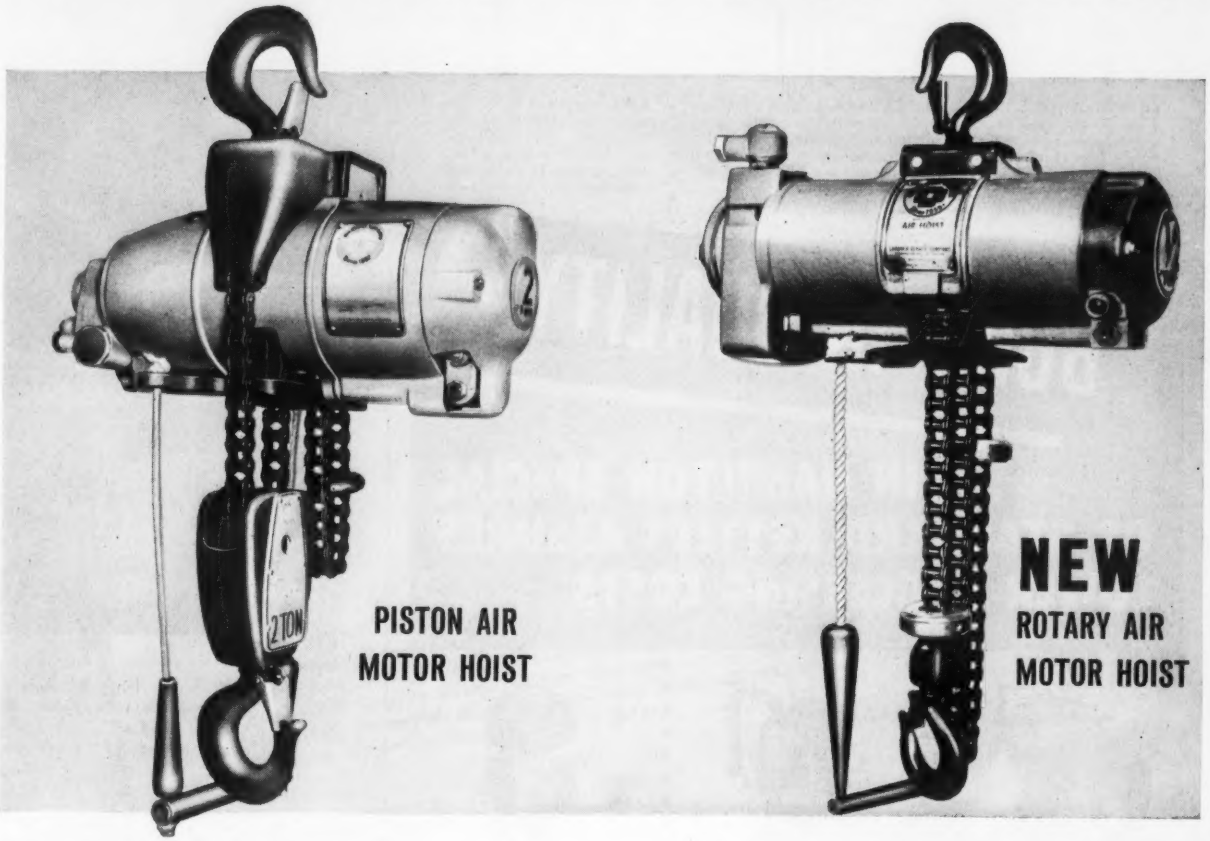
# WORK HORSE...RACE HORSE

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| PISTON HOISTS | | | |
|---|---|---|---|
| MODEL | CAPACITY | SPEED | WEIGHT |
| 86-1V10 | 1000 | 19 | 28 |
| 86-2V20 | 2000 | 19 | 78 |
| 86-2V40 | 4000 | 10 | 100 |

| ROTARY HOISTS | | | |
|---|---|---|---|
| MODEL | CAPACITY | SPEED | WEIGHT |
| 86R-5 | 500 | 90 | 27 |
| 86R-10 | 1000 | 40 | 27 |
| 86R-20 | 2000 | 20 | 30 |

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**SA**—streamlined balloon jacket design. Extra large diameter provides greater heating surface. Sizes 15 to 500 gallons. Constructed for steam working pressures of 40, 90 and 125 pounds.

**SA MIX COOKER**—has single or double motion agitator with or without hydraulic lift. Agitator lifts easily and smoothly out of cooker. Sizes 30 to 500 gallons.

**CW**—designed to process batches up to 150 gallons. Positive worm gear. Handwheel gives control of capacity loads while tilting. Large diameter kettle gives fast even cooking.

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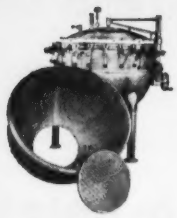
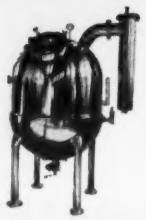
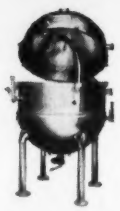


**PC**—stainless steel pressure cooking kettle for meat and poultry processing. 90 p.s.i. in jacket and 15 p.s.i. in kettle. Quick opening latches. Top is lifted by eccentric lever. Sizes 30 to 250 gallons.



**HV**—vacuum cooker from 150 to 500 gallons. Hinged manhole provides access to the inside. Available with a mixer—circulator can be installed to increase heat transfer and agitation.



**VT**—vacuum cooker has no equal for small batches. Tilting top easy loading. Sizes 30 to 150 gallons. Jacketed for 90 p.s.i. steam working pressure.

**SPECIAL**—PC Style Pressure type mix-cooker. Jacket to full 200 gal. level. Plate type heating-cooking coils arranged to act as agitator baffle plates. Entire unit removable for easy cleaning.

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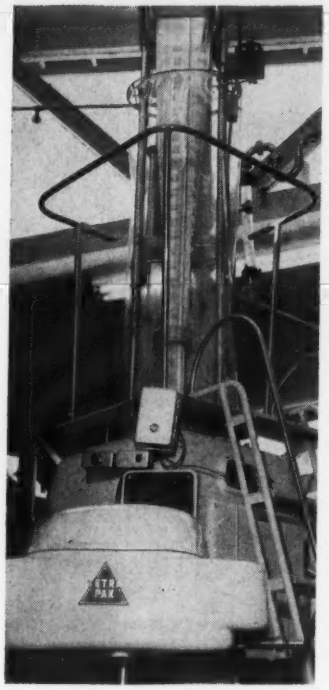
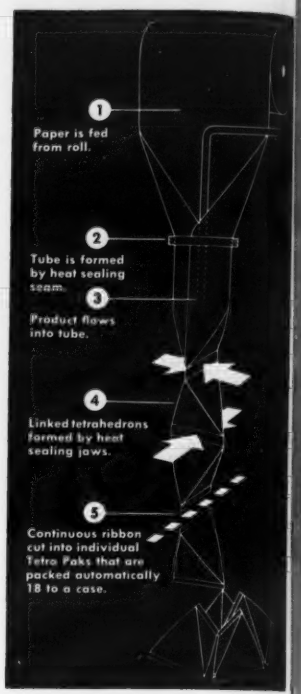
## Aseptic Packaging (*Continued from page 45*)




1
Paper is fed from roll.
2
Tube is formed by heat sealing seam.
3
Product flows into tube.
4
Linked tetrahedrons formed by heat sealing jaws.
5
Continuous ribbon cut into individual Tetra Paks that are packed automatically 18 to a case.

**Web of laminate enters sterile nitrogen-filled chamber formed by polyethylene film hood. Here it is formed into tube, filled and formed into tetrahedron-shaped sterile package at rate of 72 half pints per min. Key steps are shown in diagram at right**

form the bottom seal, and a ¾-in.-diam stainless steel tube fills container with sterile product.

When container is completely full, another set of clamps seal top, at right angles to first seal, forming the tetrahedron. Product completely fills container, so oxygen is excluded.

Sealing is accomplished by impulse heating which delivers burst of electrical energy as jaws clamp shut, and fuses the laminate in a gas- and liquid-tight seal which is superior to former steady-heat seal method.

Nitrogen from cylinders is sterilized in an electric tube heater at 500 F and conducted to filling point in an electric-traced pipe. Nitrogen usage is expected to add only negligible cost to the operation.

**Other applications:** Pure fruit juices also have been successfully packaged aseptically by Tetra Pak method, including orange, grape, prune and apple. Jams and jellies have been run, as has tomato juice.

Liquid products stand best chance of success. Foods having particles much larger than strawberry seeds will interfere with proper sealing in present system.

Both Real-Fresh and Associated Beverages plan new products for non-refrigerated distribution. Real-Fresh has an aseptic apple juice under consideration, a baby formula and other dairy products.

The future appears bright for many new liquid products for non-refrigerated distribution. Ultra-high short-time sterilization helps preserve flavor, and low carton cost makes the economics attractive.

**Package costs:** Formerly, Real-Fresh milk was marketed by aseptic canning. Cost of 8-oz can was 2.9 cents. Half-pint Tetra Pak material cost is 0.9 cents, plus 0.3 cents prorated for the hexagonal shipping carton (see photo).

Shipping weight is reduced by 15 per cent or more for equivalent product in cans. Eighteen Tetra Pak half pints are packed per hexagonal carton. Cubage is about same in cans or Tetra Pak, according to Joseph Zatkin, President of Associated Beverages.

## Key Suppliers

**Sources for additional information**

Aseptic Tetra Pak former-filler-sealer machine is manufactured in the US by Tetra Pak Co., Inc., 939 Rahway Ave., Union, N.J.
6920 on Reader Service Slip.

Aseptic technique and Graves-Stambaugh heat exchange equipment is licensed through: Tetra Pak Co., Inc. 939 Rahway Ave., Union, N.J.
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and through:
Graves-Stambaugh Corp., 10 S. LaSalle St., Chicago 3, Ill.
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APV plate heat exchanger is manufactured by A.P.V. Company, Inc., 137 Arthur St., Buffalo 14, N.Y.
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Tetra Pak laminate for aseptic packaging is development of Crown Zellerbach Corp., 1 Bush St., San Francisco, Calif.
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Electric heater for sterilizing nitrogen from cylinders, adapted to Bireley's requirements by Pacific Oxygen Co., 2205 Magnolia, Oakland, Calif., is product of Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa.
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Kemp generator for sterile nitrogen is manufactured by C. M. Kemp Manufacturing Co., 415 E. Oliver St., Baltimore 2, Md.
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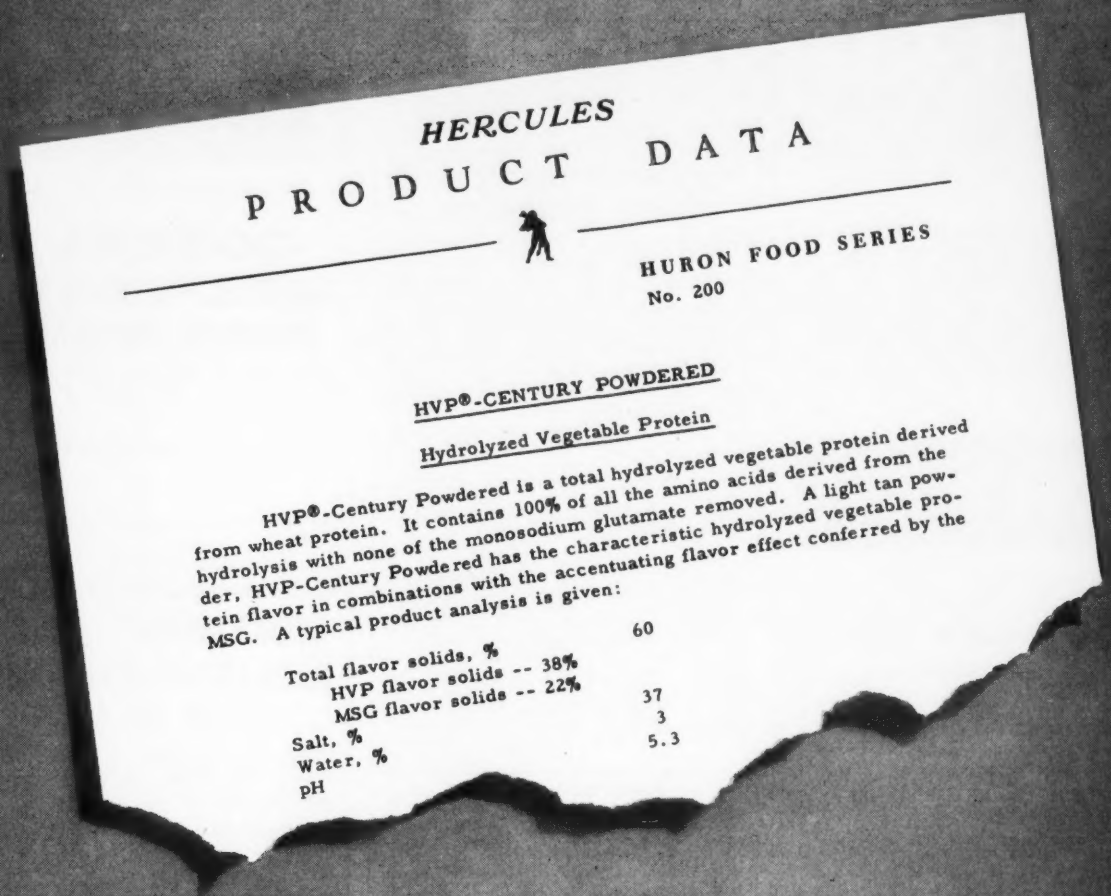
**A LOT OF HELP**

There's a storehouse of information offered in technical literature. See the listing in this issue beginning on 119.


# THIS DATA SHEET CAN SAVE YOU AS MUCH AS 20% ON MSG, HVP COST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No. 200

HVP®-CENTURY POWDERED
Hydrolyzed Vegetable Protein

HVP®-Century Powdered is a total hydrolyzed vegetable protein derived from wheat protein. It contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed. A light tan powder, HVP-Century Powdered has the characteristic hydrolyzed vegetable protein flavor in combinations with the accentuating flavor effect conferred by the MSG. A typical product analysis is given:

| | |
|---|---|
| Total flavor solids, % | 60 |
| HVP flavor solids -- 38% | |
| MSG flavor solids -- 22% | |
| | 37 |
| Salt, % | 3 |
| Water, % | 5.3 |
| pH | |

Now—besides its full line of HVP powder and liquids as well as MSG—Hercules offers HVP®-Century powdered, a total hydrolyzed vegetable protein derived from wheat protein. Containing 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed, this new product offers the possibility of cost savings and processing advantages wherever the flavor of well-browned beef is desired.

This new four-page data sheet provides complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. We'll be glad to send you a copy along with a sample of HVP-Century. For information, write to

*Huron Milling Division, Virginia Cellulose Department*
HERCULES POWDER COMPANY
INCORPORATED
*900 Market Street, Wilmington 99, Delaware*

VH60-2

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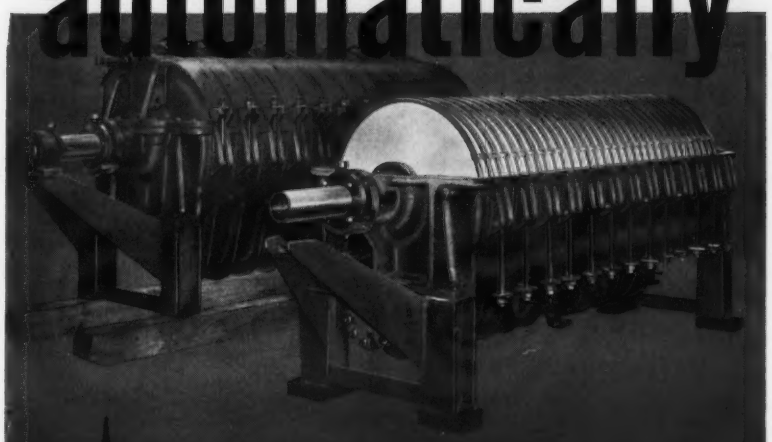

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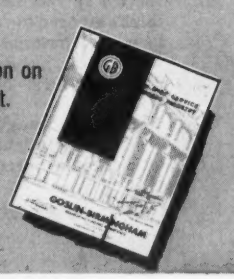

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| 6877 | 6920 | 6963 | 7006 | 7049 | 7092 |
| 6878 | 6921 | 6964 | 7007 | 7050 | 7093 |
| 6879 | 6922 | 6965 | 7008 | 7051 | 7094 |
| 6880 | 6923 | 6966 | 7009 | 7052 | 7095 |
| 6881 | 6924 | 6967 | 7010 | 7053 | 7096 |
| 6882 | 6925 | 6968 | 7011 | 7054 | 7097 |
| 6883 | 6926 | 6969 | 7012 | 7055 | 7098 |
| 6884 | 6927 | 6970 | 7013 | 7056 | 7099 |
| 6885 | 6928 | 6971 | 7014 | 7057 | 7100 |
| 6886* | 6929 | 6972 | 7015 | 7058 | 7101 |
| 6887 | 6930 | 6973 | 7016 | 7059 | 7102 |
| 6888 | 6931 | 6974 | 7017 | 7060 | 7103 |
| 6889 | 6932 | 6975 | 7018 | 7061 | 7104 |
| 6890 | 6933 | 6976 | 7019 | 7062 | 7105 |
| 6891 | 6934 | 6977 | 7020 | 7063 | 7106 |
| 6892 | 6935 | 6978 | 7021 | 7064 | 7107 |
| 6893 | 6936 | 6979 | 7022 | 7065 | 7108 |
| 6894 | 6937 | 6980 | 7023 | 7066 | 7109 |
| 6895 | 6938 | 6981 | 7024 | 7067 | 7110 |
| 6896 | 6939 | 6982 | 7025 | 7068 | 7111 |
| 6897 | 6940 | 6983 | 7026 | 7069 | 7112 |
| 6898 | 6941 | 6984 | 7027 | 7070 | 7113 |
| 6899* | 6942 | 6985 | 7028 | 7071 | 7114 |
| 6900 | 6943 | 6986 | 7029 | 7072 | 7115 |
| 6901 | 6944 | 6987 | 7030 | 7073 | 7116 |
| 6902 | 6945 | 6988 | 7031 | 7074 | 7117 |
| 6903 | 6946 | 6989 | 7032 | 7075 | 7118 |
| 6904 | 6947* | 6990 | 7033 | 7076 | 7119 |
| 6905 | 6948 | 6991 | 7034 | 7077 | 7120 |
| 6906 | 6949 | 6992 | 7035 | 7078 | 7121 |
| 6907 | 6950 | 6993 | 7036 | 7079 | 7122 |
| 6908 | 6951 | 6994 | 7037 | 7080 | 7123 |
| 6909 | 6952 | 6995 | 7038 | 7081 | 7124 |
| 6910 | 6953 | 6996 | 7039 | 7082* | 7125 |
| 6911 | 6954 | 6997 | 7040 | 7083 | 7126 |
| 6912 | 6955 | 6998 | 7041 | 7084 | 7127 |
| 6913 | 6956 | 6999 | 7042 | 7085 | 7128 |
| 6914 | 6957 | 7000 | 7043 | 7086 | Back |
| 6915 | 6958 | 7001 | 7044 | 7087 | Cover |
| 6916 | 6959 | 7002 | 7045 | 7088 | 7129 |
| 6917 | 6960* | 7003 | 7046 | 7089 | |
| 6918 | 6961 | 7004 | 7047 | 7090 | |

*Since there are several items covered by this number, please list this number with the specific item on which you want additional information in the "Multiple Listings" column at right.

FOOD PROCESSING Handbook Suggestion: .....

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### Multiple Listings

for items with*

| Key No. | Description |
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***that's interesting***

**Raw admiration**

So highly did the Greeks esteem the radish, that small replicas of the vegetable were made in gold (in connection with Apollo worship). On the other hand, the Greeks were satisfied with replicas of beets in silver, and of turnips in lead.

**Almost instant success**

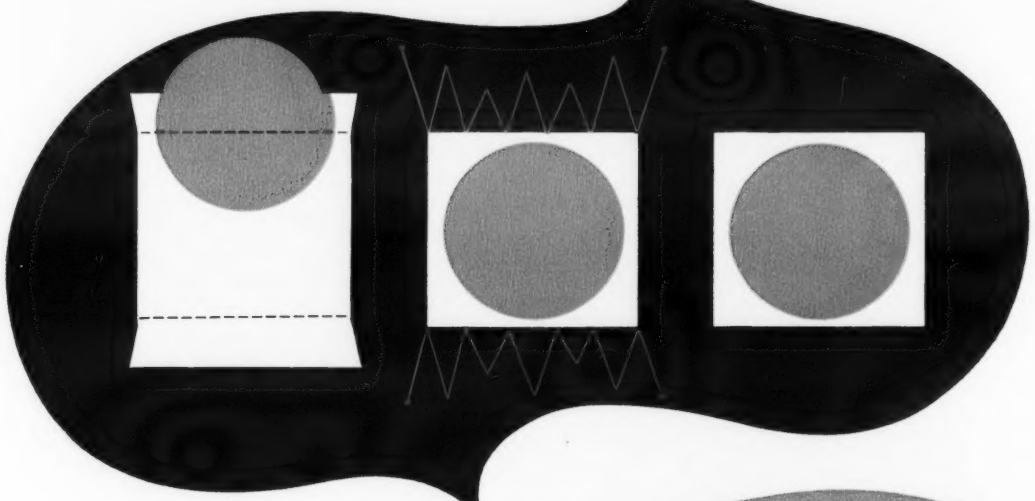
Since a German scientist named Mr. Ludwig Roselius invented a process half a century ago which took the insomnia out of coffee, decaffeinated coffee has grown into a multi-million-dollar industry. Today, one brand alone, Instant Sanka, is a close contender for second place among the more than 450 different brands of all instant coffees.

**Snappy dish**

Alligator meat was a real delicacy for some of the Union Soldiers serving in the deep South during the Civil War. Served for supper as a roast, then served in the form of hash for breakfast, the 'gators actually shoved fresh beef off the menu in some instances.


# PACK IT

## WITH RADIO WAVES



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